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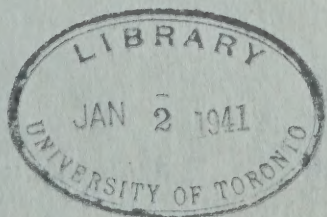
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DOMINION OF CANADA—DEPARTMENT OF AGRICULTURE

Prices and Returns  
*for*  
Nova Scotia Apples

A. E. RICHARDS

MARKETING SERVICE  
ECONOMICS DIVISION



Published by authority of the Hon. JAMES G. GARDINER, Minister of Agriculture,  
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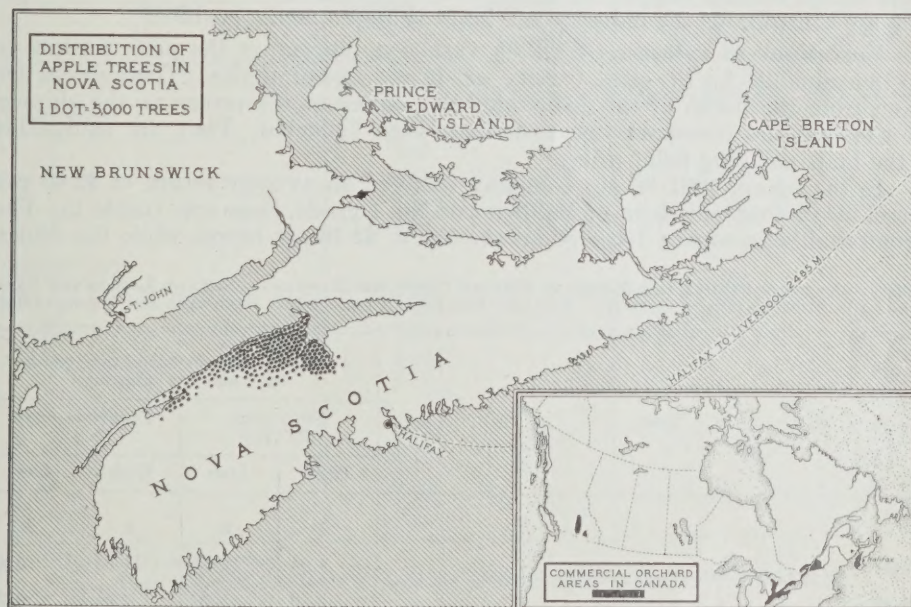




# Prices and Returns for Nova Scotia Apples

A. E. RICHARDS

From the standpoint of the apple producer the final test of any marketing service is in the price return. If an added service increases the net return to the grower in relation to those without the service, it is regarded as a benefit. If the net return is diminished by reason of the additional operation, the grower using the service is at a disadvantage although it may be for the general good. A useful means of determining the value of a marketing service and the efficiency of operation is by comparison with other agencies doing the same job. On that basis the services rendered and marketing operations of a number of apple packing companies are appraised in this study.



Commercial apple growing in Nova Scotia is confined to the sheltered valleys bordering on the Minas Basin and the Bay of Fundy.

NOTE.—The distribution of the apple trees is based on the orchard census of the Nova Scotia Department of Agriculture, 1939.

## Commencement of the Survey

In 1934 the Nova Scotia Department of Agriculture requested the Economics Division of the Dominion Department of Agriculture to undertake a survey of the marketing of the Nova Scotia apple crop. This was to deal with the movement of the apples from the orchard to the market in the United Kingdom. Consideration was to be given to pack-out and grades in relation to returns through specific fruit companies with particular attention to cold storage warehouses.

The 18 companies included in the study were selected at a meeting with representatives of the Nova Scotia and Dominion Departments of Agriculture and the Nova Scotia Fruit Growers Association in the fall of 1934. The companies were considered a representative cross-section of the apple packing industry in the province on the basis of size, location and method of operation. All statistics on price returns and company operations were taken directly from office records and the survey was extended to include the seven-year period 1931 to 1937.

### The Problem and Purpose of the Study

The purpose of the study on which this summary is based was an endeavour to measure more accurately the price returns for variety, grade and size of apples and to attempt an explanation for the wide variations in returns. Furthermore, the tabulating of the information showed that some companies consistently returned more to their grower-patrons than others. To assist in explaining this situation a number of factors associated with financial condition, operating costs and efficient management have been related to the net returns of the consistently high and consistently low companies. The analysis indicates that certain differences in net returns can be explained and are controllable. To the extent that they are controllable the industry can improve its economic position.

**Variations in returns.**—Striking variations appear in the price returns to the 18 companies for the same variety, grade and size of apples. These prices are taken from the books of the companies and represent the return to the shipper after selling and transportation costs have been deducted. They are equivalent to the f.o.b. shipping point price.

In the season 1931-32 one company received an average return of \$2.80 per barrel for its total shipment of Baldwins of No. 1 grade, large size (table 1). The second ranking company received an average of \$2.76 per barrel, while the return

TABLE 1.—AVERAGE RETURN PER BARREL TO PACKING COMPANIES RANKING FIRST AND LAST IN THE PRICE RANGE FOR NUMBER ONE, LARGE (2½" UP) AND DOMESTIC SMALL (2-2¼") BALDWINS FOR YEARS 1931-37

Year	Average return per barrel received by high and low company			
	No. 1 large (2½" up)		Domestic small (2-2¼")	
	High	Low	High	Low
	\$	\$	\$	\$
7 years.....	3.04	2.15	1.65	0.83
1931-32.....	2.80	1.70	2.04	0.73
1932-33.....	3.28	1.87	1.62	0.89
1933-34.....	2.96	1.48	1.55	0.35
1934-35.....	3.50	1.65	1.75	0.67
1935-36.....	4.41	2.50	3.15	1.00
1936-37.....	3.49	1.00	1.32	0.32
1937-38.....	3.50	2.30	1.67	1.06

to the low company for the same variety, grade and size was \$1.70, or \$1.10 per barrel below the top-ranking company. If this were the situation in one year only, it might be regarded as accidental but in each of the seven years the range is equally high or higher. Not only do these wide variations persist in each season, but they also hold for each variety.

Wide variations appear also in the prices received for the Domestic grade. In the season 1931-32 the return for small size Domestic grade of Baldwins ranged from a high of \$2.04 to a low of 73 cents which resulted in a difference in the return to the high and low company of \$1.31 (table 1). In each season similar differences appear. Furthermore, in the season 1931-32 three companies obtained



a higher return for their Domestic small Baldwins, the lowest quality of apples packed in the standard export grades, than four companies received for their top grade of the same variety. Similar price relationships may be observed in the seasons which followed.

**Consistency of variations among companies.**—Certain companies consistently received higher returns than others. Company number 16 received a seven-year average return of \$2.51 per barrel of apples (table 2). The companies are ranked on the basis of this return in upper, middle and lower thirds. The crosses indicate the position of the companies in each of the seven years. Reading along the top line, the crosses indicate that Company 16 was in the upper third bracket in each of the years 1931-37. Company 17 ranks sixth on the seven-year average. Reading across the line, it is seen to have fallen into the middle bracket in 1931, in the lower third in 1932 and in the years 1933-37 its average placed it among the upper third.

TABLE 2.—RANKING OF COMPANIES ON SEVEN-YEAR AVERAGE PRICE RETURNS FOR SEVEN MAIN VARIETIES AND RELATIVE POSITION OF EACH COMPANY IN EACH YEAR 1931-37

Company	Seven-year average return	Ranking position of companies in each year		
		Upper third	Middle third	Lower third
		1931-37	1931-37	1931-37
	\$	'31-2-3-4-5-6-7	'31-2-3-4-5-6-7	'31-2-3-4-5-6-7
Upper third:				
16.....	2.51	x x x x x x x		
7.....	2.41	x x x x x	x x	
15.....	2.41	x x x x x	x	x
2.....	2.39	x x x x x		x
6.....	2.33	x x x x x	x	x
17.....	2.30	x x x x x	x	x
Middle third:				
9.....	2.26	x x x x	x x x x	x
4.....	2.25	x x x x	x x x x	
12.....	2.24	x x x x x	x x x x x	
13.....	2.21		x x x x x	x
18.....	2.14	x x x x	x x x x	x x x x
11.....	2.12		x x x x	x x x x x
Lower third:				
5.....	2.11		x x x x	x x x x x
14.....	2.10	x x x x	x x x x	x x x x
10.....	2.10		x x x x	x x x x x
8.....	2.06		x x x x	x x x x x
1.....	1.97 <sup>1</sup>	x x x x		x x x x x
3.....	1.92			x x x x x x x

<sup>1</sup>Based on 6 years' average.

NOTE.—Data on which this table is based are shown in detail in the appendix (Table 48).

Table 2 also indicates trends of individual companies during the period. Company 17 improved its relative position during the seven years. Company 14 steadily lost ground from a position in the upper third group in 1931.

The top ranking companies maintained a relatively high position throughout the seven years. In 33 out of the 42 cases the top ranking companies are in the upper third bracket. Likewise, a number of the low companies seldom moved out of the lowest bracket. The seven-year average difference between the high and the low group was 35 cents and the range between the high and low company amounted to 59 cents a barrel. The difference between the medium group and the low group was 16 cents a barrel. Since the low group had relatively higher packing charges, the differences in the net returns to the growers showed an even wider range.

The problem is two-fold then, first to explain the variation in returns and secondly by a study of the more successful companies to suggest ways to increase the returns to producers. Orchard management and the quality of fruit brought

into the packing houses undoubtedly have an influence on the final net return to each producer. Apart from this, however, after the fruit is received at the packing house and during handling and shipping overseas it encounters many adverse conditions of a physical and economic nature which may cause loss or a reduction in returns.

It is to the latter phase of the problem that this study is directed. The problem is to segregate the factors which have an influence on price return and to determine which are controllable. Controllable factors must be studied by the grower, the packing-house manager, the land and ocean transportation companies and the selling agents in an endeavour to eliminate the hazards of loss to the grower.

### Trends in Nova Scotia Apple Production

There has been a general decline in the number of bearing apple trees in Canada from 1901 while statistics on bearing trees in Nova Scotia show a marked upward trend to 1921. As a result of these changes the census of 1931 shows Nova Scotia to have 22 per cent of the total bearing apple orchard in Canada (table 20A).<sup>1</sup> During the eight years 1931 to 1938 Nova Scotia's annual production of apples has averaged approximately 2 million barrels. This is about 39 per cent the total production of the Dominion (table 21A).



Typical home of an orchardist in the Annapolis Valley.

in the eight years 1931 to 1938. The proportion sold in Canada has increased slightly (table 3).

#### *Utilization of the apple crop.*

The proportion of the Nova Scotia apple crop diverted to processing plants for manufacture into apple products has averaged approximately 20 per cent during the eight years 1931 to 1938 (table 23A). This proportion has shown an upward trend during the period. That part of the fresh fruit sales which were made on the export market has shown a slight decline

TABLE 3.—PROPORTIONS OF THE NOVA SCOTIA COMMERCIAL PACK OF APPLES SOLD ABROAD AND IN CANADA

Year	Com- mercial pack	Total exports	Exports to United Kingdom	Sold in Canada
	barrels	p.c.	p.c.	p.c.
1931-32 .....	1,327,500	92	81	8
1932-33 .....	953,400	93	90	7
1933-34 .....	2,338,400	97	81	3
1934-35 .....	1,689,700	79	70	21
1935-36 .....	1,520,000	90	89	10
1936-37 .....	1,083,900	76	61	24
1937-38 .....	1,567,900	83	76	17
1938-39 .....	1,939,600	91	81	9

<sup>1</sup> Refers to table 20 in the appendix; (A) has the same connotation throughout the report.



**Number of varieties.**—The number of varieties of apples grown and exported from Nova Scotia appears unnecessarily high (table 24A). During the five years for which records were available, 15 varieties made up approximately 90 per cent of the export shipments. From 100 to 190 varieties accounted for the remaining 10 per cent. Small odd lots add to handling costs in the packing houses, in transit and at the place of sale. Although the odd variety may at times sell for as high a price as the standard variety the added costs of handling and selling tend to reduce the average net returns for all varieties.

### **Importance of the United Kingdom to the Nova Scotia Fruit Industry**

From 85 to 90 per cent of that part of the apple crop of Nova Scotia which is sold as fresh fruit is exported out of Canada (table 3). Of the total exports approximately 90 per cent go to the United Kingdom.

The Nova Scotia grower produces apples for export, chiefly for the United Kingdom market. His whole organization is tuned to that market. The varieties grown are those in demand in England and Scotland and a number of them are



Bin of apples at a processing plant in Nova Scotia, 1934. The proportion of the apple crop diverted to processing plants for manufacture into apple products has averaged approximately 20 per cent during the eight years 1931 to 1938.

unknown to the great majority of consumers in Canada. During each growing season representatives from the commission houses in the Old Country visit the Annapolis Valley in the interest of the firms they represent. Not only do they solicit orders but in many instances have advanced funds against future consignments of apples. Canadian apple buyers are infrequent visitors in the Valley and when sales are made on the domestic market the transactions usually originate in Nova Scotia. In years of heavy production in England such as 1934 and 1936, Canadian markets, chiefly Montreal and other consuming centres in Quebec are looked to for disposal of the surplus.

**Competing supplies.**—Apple production in England has shown an upward trend during the seven years 1931 to 1937 with extreme fluctuations from year to year (table 25A). The average annual production during the period was approximately 3 million barrels. The peak year of 1934 with a production of nearly 7 million barrels was 122 per cent above the average. The following year a crop



of  $1\frac{1}{4}$  million barrels was harvested or 61 per cent below the average for the seven years. Imports from all countries throughout the months September 1 to March 31, the period during which Nova Scotia apples are in competition with other supplies, averaged 4 million barrels during the seven years. The range was 34 per cent above average in 1931 to 47 per cent below in 1936. Annual crop season imports from Nova Scotia have averaged 1,171,547 barrels from 1931 to 1937. The high in 1933 was 60 per cent above the average and the low in 1936 fell to 63 per cent below average. Since imports have varied inversely with domestic production, total supplies show much less fluctuation, moving up to almost 10 million barrels in 1934 and dropping to approximately 6 million in 1935. This was a range of 40 per cent above average and 19 per cent below average respectively.

Throughout the seven years 1931 to 1937 Nova Scotia growers have contributed on the average 17 per cent of the total accountable supplies of apples in the United Kingdom during the period September 1 to March 31 (table 4). Of the

TABLE 4. UNITED KINGDOM IMPORTS OF APPLES FROM NOVA SCOTIA IN RELATION TO TOTAL SUPPLIES AND TOTAL IMPORTS OF APPLES

Year	Nova Scotian arrivals September to April	
	In per cent of total supplies	In per cent of total imports
	p.c.	p.c.
Seven years.....	17	30
1931-32.....	16	21
1932-33.....	13	19
1933-34.....	27	43
1934-35.....	12	40
1935-36.....	24	30
1936-37.....	9	32
1937-38.....	21	33

total imports from all countries throughout the seven years Nova Scotia supplied 30 per cent. These figures give some indication of the important place which Nova Scotia apples hold in the United Kingdom market. To the Nova Scotia apple producer they should emphasize the importance of holding an established market. This will not be accomplished by urging the consumer in the United Kingdom to eat more Nova Scotia apples or by an appeal on the sentimental grounds of Empire preference. Growers must realize that the 500 million apples which find their way annually into the shop windows in the Old Country are their best advertising and selling agents. If those agents have the right appearance and are backed up with quality and dependability they will sell themselves and establish a market for others to follow.

### Representativeness of the Sample

Price comparisons in the study were based on returns from the sale of 1,981,569 barrels of apples in the seven years 1931 to 1937. This is approximately 15 per cent of the total crop of the province during that period. The analysis of prices and returns has been confined to 12 standard varieties. The sample includes 19 per cent of the total production of these varieties. Tests for representativeness from the standpoint of grade and size of apples showed a reasonably close correspondence between the sample used and the entire commercial production. On this basis the relationships and conclusions arrived at from an analysis of the sample may be applied with confidence to the prices and returns for the entire commercial apple crop of the province.

## Factors Influencing Price

Variety is a factor of major influence on price return.<sup>2</sup> Among varieties the factors influencing the return directly are yield<sup>3</sup> and pack-out<sup>4</sup> which can be definitely measured. Indirectly the influence of grade (table 5) and size<sup>5</sup> is reflected in the average return per barrel for a particular variety. The sum-product of these factors indicates the relative net return per tree.<sup>6</sup> While consideration must be given to the extra cost of handling the higher-yielding varieties it is on the basis of net return per tree or per acre that the grower must decide on any program of new planting, top-working or elimination of varieties. This is mainly an individual orchard problem but it is well to keep in mind that due to high yields and a relatively light shrinkage, a number of low-priced varieties may be more profitable than others which bring a higher price on the market.

TABLE 5.—PERCENTAGE OF PACK-OUT IN NO. 1 GRADE AND THE RELATIVE POSITION OF VARIETIES IN EACH YEAR 1931-37

Variety and ranking	Seven-year average pack-out	Ranking position of varieties in each year		
		Upper third 1931-37	Middle third 1931-37	Lower third 1931-37
	p.c.	'31-2-3-4-5-6-7	'31-2-3-4-5-6-7	'31-2-3-4-5-6-7
Upper third:				
Red Gravenstein.....	68 <sup>1</sup>	x x x x x		
Cox Orange.....	66	x x x x x x x		
McIntosh Red.....	62	x x x x x x	x	
Ribston.....	59	x x x x x	x x	
Middle third:				
Stark.....	56	x	x x x x x x	
Wagener.....	56	x	x x x x x x	
Golden Russet.....	54	x x	x x x x x	
King.....	51		x x x x x	x x
Lower third:				
Gravenstein.....	49	x	x	x x x x
Ben Davis.....	42		x	x x x x x x
Baldwin.....	40			x x x x x x x
Northern Spy.....	35			x x x x x x x

<sup>1</sup>Based on 5 year average.

**Premium on quality.**—The price return is the final and in general a very effective test of quality. That the wholesale buyer who reflects consumer demand is ready to pay a premium for quality fruit as judged by appearance is very evident from a comparison of returns for No. 1 and Domestic grades. The premium ranges from 53 cents per barrel for Starks to \$1.04 per barrel for Golden Russets. Since varieties differ greatly in price, the percentage premium is a more significant measure.<sup>7</sup> On this basis the largest premium was obtained for

<sup>2</sup> Seven-year average return. Golden Russet \$3.49, Red Gravenstein \$3.48, McIntosh Red \$2.96, Cox Orange ( $\frac{1}{2}$  brls.) \$2.57, King \$2.48, Northern Spy \$2.42, Wagener \$2.37, Ribston \$2.26, Baldwin \$2.12, Stark \$1.96, Ben Davis \$1.94, Gravenstein \$1.88.

<sup>3</sup> Twenty-six years average production per tree in barrels. McIntosh Red 2-10, Red Gravenstein 1-26, Northern Spy 1-71, Cox Orange 0-75, Ben Davis 1-68, King 1-22, Ribston 1-26, Gravenstein 1-38, Stark 1-37, Wagener 0-92, Golden Russet 0-65, Baldwin 1-02.

<sup>4</sup> Seven-year average pack-out in per cent. Red Gravenstein 89, Gravenstein 88, Wagener 88, McIntosh Red 87, Cox Orange 84, Ribston 84, King 84, Baldwin 81, Northern Spy 80, Golden Russet 79, Ben Davis 79, Stark 78.

<sup>5</sup> Percentage large size, 2 $\frac{1}{2}$  inches up. King 92, McIntosh Red 76, Red Gravenstein 74, Northern Spy 71, Gravenstein 70, Stark 67, Wagener 61, Baldwin 58, Ben Davis 57, Ribston 43, Golden Russet 34, Cox Orange 22.

<sup>6</sup> Average return per tree. McIntosh Red \$5.41, Red Gravenstein \$3.90, Northern Spy \$3.31, Cox Orange \$3.24, Ben Davis \$2.57, King \$2.54, Ribston \$2.39, Gravenstein \$2.28, Stark \$2.09, Wagener \$1.92, Golden Russet \$1.79, Baldwin \$1.75.

<sup>7</sup> Percentage premium for No. 1 grade over Domestic grade. Cox Orange 54, Baldwin 50, Ribston 45, Gravenstein 45, Red Gravenstein 38, Ben Davis 36, Golden Russet 36, Wagener 35, Northern Spy 35, McIntosh Red 34, Stark 31, King 28, All varieties 39.

Cox Orange and almost equally high premiums were received for top quality over second quality apples for Baldwins, Ribstons and Gravensteins. It would seem to be in the growers' interest to go to some additional expense in production to improve the quality of varieties which return these relatively high premiums and thus to obtain the price advantage in the higher grade.

For all varieties the average premium for the No. 1 grade over Domestics was 39 per cent. This indicates that the government standard grades have a definite meaning to the packing companies and that in general they are putting out their pack on that basis. While the wholesale buyer and the consumer may not purchase on grade designation but rather on appearance and condition of the fruit, this tabulation indicates a very definite association between quality as judged by the consumer at one end of the line of distribution and the fruit packing company at the other. To the fruit grower who turns his apples over to the packing company in trust and for which he receives a pooled average return based on grade this relationship should be reassuring.



Orchard management and the quality of fruit brought into the warehouse have an important influence on the final net return to each producer. Apples are carefully picked and handled by this orchardist to prevent bruising and to improve the quality of the pack.

**Premium on size.**—For most of the standard varieties the consumer in the United Kingdom is ready to pay a premium for a large-sized apple over the medium and small sizes.<sup>8</sup> For three varieties, Gravenstein, Cox Orange and Ribston, the consumer shows a preference for medium-sized apples in No 1 grade. In the Domestic grade a greater premium was paid for the large sizes over the medium sizes than in the No. 1 grade.<sup>9</sup> For all varieties the premium for large

<sup>8</sup> Percentage premium for large over medium size in No. 1 grade. Stark 25, Baldwin 19, Northern Spy 13, Red Gravenstein 11, Ben Davis 10, King 9, McIntosh Red 6, Wagener 6, Golden Russet 3, Gravenstein 0, Cox Orange -3, Ribston -6, All varieties 7.

<sup>9</sup> Percentage premium for large over medium size in the Domestic grade. Northern Spy 35, Baldwin 32, Gravenstein 30, Stark 27, McIntosh Red 25, Ben Davis 19, King 16, Wagener 11, Red Gravenstein 10, Golden Russet 3, Ribston -2, Cox Orange -4, All varieties 15.



size over medium size in the No. 1 grade was 7 per cent compared with 15 per cent in the Domestic grade. Higher premiums were paid for size in the cooking varieties than in the dessert classes while size was discounted in certain varieties of apples usually eaten out of hand.

In each variety the medium-sized apples obtained a relatively large premium over the small sizes in No. 1 grade. This averaged 26 per cent for all varieties. In the Domestic grade the premium averaged 23 per cent. In each variety the medium sizes brought higher returns than the small sizes.

### Supply and Price

Supplies of apples arrive on the main markets of the United Kingdom with extreme irregularity from week to week. Nevertheless prices are relatively stable (fig. 1). A relationship of some significance was apparent between the price of apples at Liverpool and import arrivals for the same week at Liverpool and at all ports in the United Kingdom. Prices at Liverpool were more closely associated with total supplies than with arrivals from Nova Scotia or all of Canada (table 28A). Based on the relationships derived from this analysis the total supplies

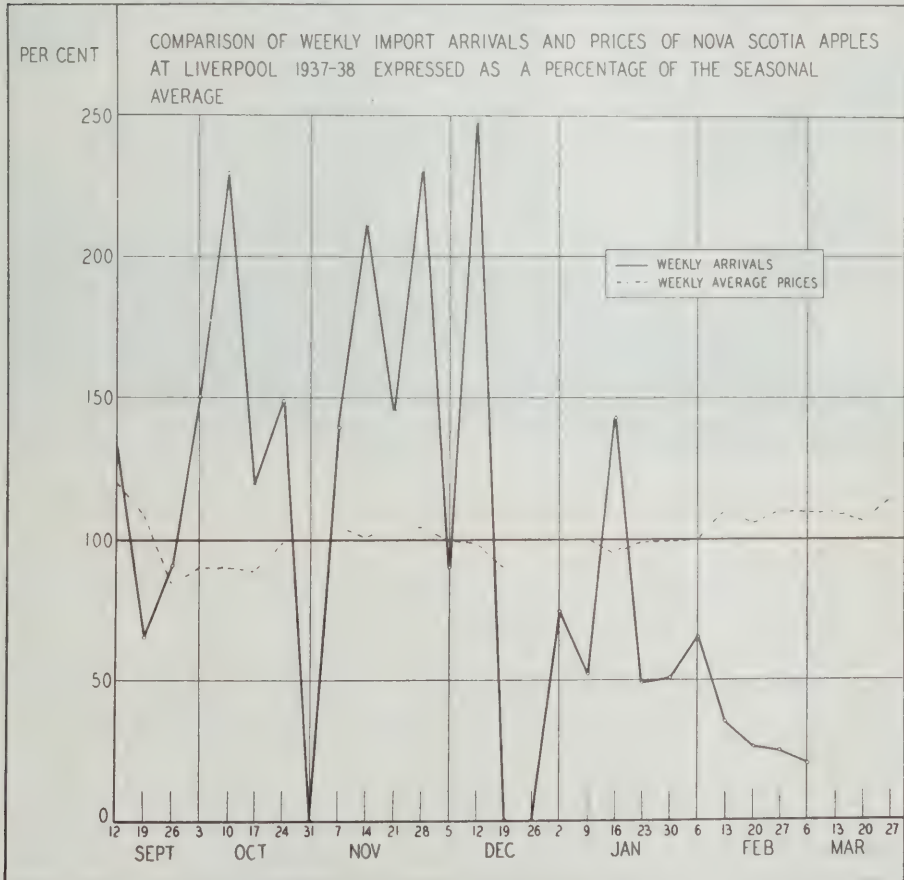


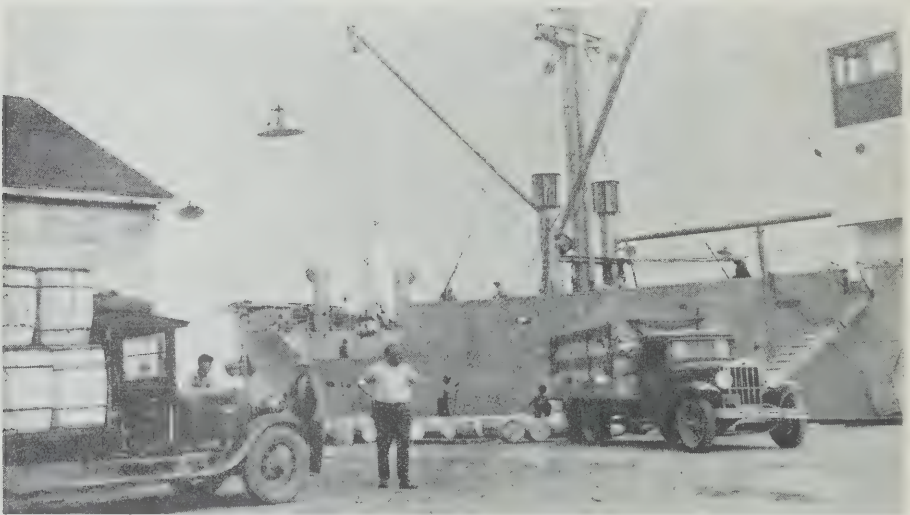
FIG. 1.—Supplies of apples from Nova Scotia arrive on the main markets of the United Kingdom with extreme irregularity from week to week. Nevertheless, prices are relatively stable.

NOTE.—Data on which this chart is based are shown in detail in tables 26 and 27 of appendix.

from all countries arriving at all ports in the United Kingdom had more influence on price at Liverpool than arrivals at Liverpool. This indicates a fluid market and suggests that buyers are in constant touch with all markets when filling their requirements for inland points.

**Inter-market shipments.**—Growers located at long distances from their market and unfamiliar with conditions of sale are frequently suspicious of the treatment they receive by their agents. In Nova Scotia the method of sale and shipment of the apple crop does not tend to reduce the growers' uneasiness in this matter. Apples are usually shipped without directions or orders to a broker or commission agent in the United Kingdom for sale on open consignment. Although the central sales agencies of two co-operative organizations exercise some regulation of their own shipments, many shipments move forward blindly. It is not unusual for certain markets to be temporarily over- or under-supplied.

Probably due to this situation the opinion has been expressed that buyers are profiting by moving fruit from one market to another to obtain a price advantage.



Eighty to eighty-five per cent of the commercial pack of Nova Scotia apples is exported out of Canada. Of the total exports approximately 90 per cent go to the United Kingdom.

In order to throw light on this situation an analysis was made of the prices of the same variety, grade and size of apples sold during the same week on a number of important markets in the United Kingdom (table 29A).

The range in price during a day or week of sale was in most instances larger on any single market than the difference in average prices between markets. Taking into consideration transportation charges between markets, any movement between auctions or market places except under unusual circumstances appears an exceedingly risky undertaking.

The study has indicated the uncertainty of price improvement through regulating Nova Scotia supplies of apples with respect to quantity and destination in the United Kingdom. Before Nova Scotia producers contemplate any marketing program which would have for its purpose the general control or regulation of movement and sale of apples either from the producing area or in the United Kingdom, the findings in this analysis should be given careful consideration and further research undertaken to substantiate or disprove it.

### Market Preferences in the United Kingdom

Basic data under this heading were derived from weekly prices cabled to the Marketing Service, Fruit and Vegetable Division by the Canadian Fruit Commissioner in London.

Certain markets appeared to show a definite preference over others for particular varieties throughout the six-year period 1932 to 1937. Liverpool and Cardiff showed a preference for the Baldwin variety. London and Newcastle paid a higher average price for Ben Davis than other markets. Golden Russet was preferred in Liverpool and London and for Gravenstein best prices were received in Liverpool. Ribston was highly favoured in London while the Stark variety appeared to meet with equal response on all markets with respect to the price paid.

All markets paid a premium on No. 1 grade over Domestics. The differences in the size of the premiums among markets showed nothing of significance. With respect to size certain markets appeared to have a fairly definite preference. Large-sized apples of the Golden Russet, Gravenstein, King and Ribston varieties were discounted on the London auction. On most other markets with the exception of Gravensteins at Newcastle and Glasgow, the large sizes appeared to be favoured. The packing-house manager or sales agent who is familiar with the markets and preferred sizes in each is in a position to obtain a price advantage.

### Air Temperature and Shrinkage of Apples

A study was made of the average conditions with respect to air temperatures which Nova Scotia apples usually experience in their movement from the orchard to the market in the United Kingdom. An endeavour was made to relate air temperature to shrinkage and indirectly to price return. It is complementary to much valuable experimental work on this problem by the Experimental Farms Service and may be useful as a check with the results of investigations which have followed another way of approach or method.

TABLE 6.—AVERAGE AIR TEMPERATURES AND DEVIATIONS FROM AVERAGE IN DEGREES FAHRENHEIT TO WHICH APPLES SHIPPED THROUGH COMMON STORAGE ARE EXPOSED FROM ORCHARD TO AUCTION SALES ROOM FOR THE THREE SEASONS 1935-36-37

Fortnight of	At Nova Scotia shipping points			Steamers in transit	Liverpool*	
	Air	Ware- house	Fruit		Air	Relative humidity
	°F.	°F.	°F.	°F.	°F.	p c.
September 1.....	59—10*	58	64	65—4	—	—
16.....	56— 8	56	62	60—5	55—5	82
October 1.....	48— 9	51	54	58—5	52—4	81
16.....	48— 9	49	52	53—5	50—4	82
November 1.....	43— 6	45	49	50—3	45—4	86
16.....	35— 5	42	49	57—6	42—4	87

\* Interpret as average of 59 degrees with average maximum of 69 degrees and average minimum of 49 degrees.

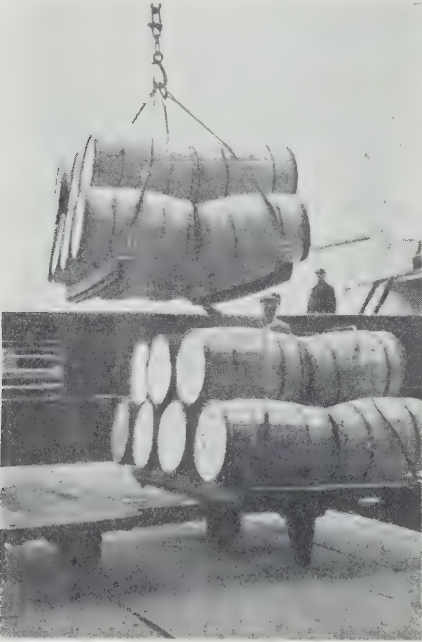
**Objectives and limitations.**—The study does not attempt to find the starting point of decay or shrinkage which leads to slackness in the apple pack. That is a problem for the horticulturist, the physiologist and the plant pathologist. Neither does it attempt to fix responsibility for loss on any agency which may handle the apples. It does show, however, that a number of factors are related to slackness and deterioration in the apple pack, which may give the plant scientists some assistance in searching for the origin of the trouble. The factors



relating to shrinkage in the apple pack in this statistical analysis of the problem were limited to variety, grade and size, season of shipment, air temperature, days in transit and ports of shipping.

The barrelled apples frequently reach the United Kingdom market in an unsatisfactory condition. Slackness of pack which results from wastage or shrinkage is probably the most serious defect.

**Average temperatures from orchard to market.**—September and October are the apple harvesting months in the fruit valley of Nova Scotia. Fruit is hauled to the packing company warehouse where early and fall varieties are made ready for shipment immediately. The great majority of fruit warehouses in Nova Scotia are of the common storage type. A number of warehouses are equipped with ventilating shafts and electric fans. The usual practice is to open the warehouse doors when the outside temperature is lower than that within the warehouse and seal up the house as far as practically possible, when the outside temperature rises above that within. However, since fruit is constantly moving in and out during the fall harvest and shipping season, temperature control is extremely difficult.



At this Halifax dock apples are transferred with a minimum of handling from the car door to the ship's hold on platform slings.

After the apple is picked from the tree vital processes of change within the fruit continue. The changes which advance the apple to a more mature state are retarded by lower temperatures and hastened by higher temperatures. Any break in the skin, the protective covering of the apple, is a source of infection for fungi whose growth is continued by higher temperatures. During the ripening process the fruit itself is generating heat. September temperatures indicate that this is going on rapidly or that the fruit at time of loading on ship has not lost its orchard heat.

In general, apples in Nova Scotia are handled through common storage warehouses of 15 to 20 thousand barrels capacity and shipped to markets in the United Kingdom in common stowage. During the last two weeks of September in the three seasons 1935, 1936 and 1937

the warehouse temperatures averaged 56 degrees Fahrenheit, fruit temperatures averaged 62 degrees (table 6). It is apparent that the common storage warehouse falls short of the optimum requirement for checking the ripening processes within the apple.

During the same period in the shipping season stowage holds of steamers in transit averaged 60 degrees with an average maximum of 65 degrees and an average minimum of 55 degrees. Air temperature at Liverpool averaged 55 degrees with a relative humidity of 82 degrees (table 6).

Average hold temperatures in transit from ports in Nova Scotia to Liverpool indicate temperatures of such degree as will encourage rather than retard ripening and deterioration if rotting is in progress or commences on board ship. As it takes on the average 8 to 11 days for apple-carrying steamers to cross the Atlantic from Halifax to Liverpool, it is evident that under such temperatures extending over this period the apples are subject to conditions which can

hardly be considered favourable. Even after arrival on the other side they encounter air temperatures combined with humidity conditions which favour further deterioration of quality in the fruit. Meteorological records show that during the fall months of the year the relative humidity at Liverpool frequently rises above 90 per cent and occasionally touches 100 per cent, the saturation point. Such humid conditions are conducive to the growth of deteriorating agencies in the fruit.

**Financial loss due to slackness in pack.**—Slack barrels constituted 10 per cent of the 12 standard varieties of Nova Scotia apples sold at auction in Liverpool during the three seasons 1935, 1936 and 1937. The average loss on each slack barrel sold amounted to 39 cents per barrel, or an average loss of 4 cents per barrel on all shipments. While much valuable research has been done on this problem, with this amount of money at stake, it would seem that further investigation is both necessary and justifiable.

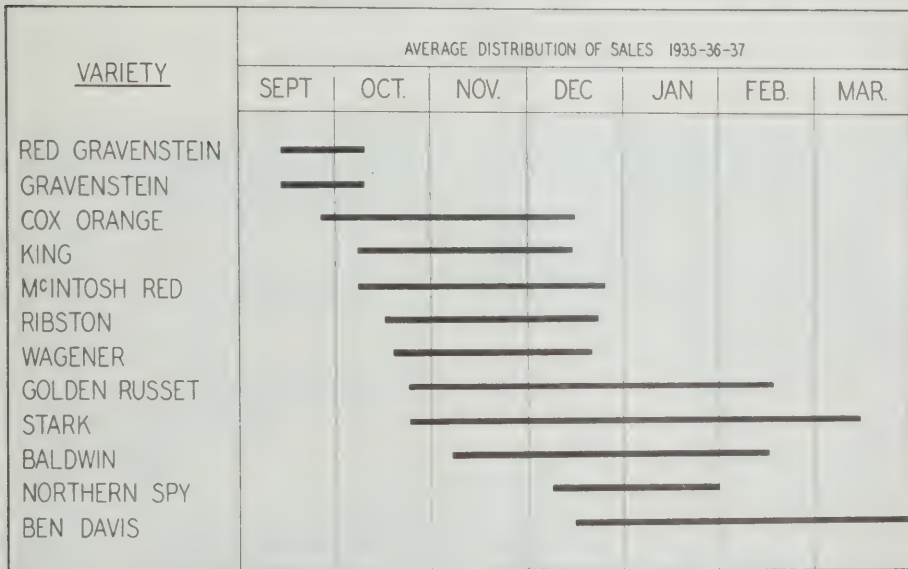


FIG. 2.—Average monthly distribution of sales by varieties of Nova Scotia apples on United Kingdom markets during the years 1935-36-37.

**Distribution of sales.**—Nova Scotia apples are consigned to commission agents in the United Kingdom and sold on arrival. The graphic presentation of the distribution of sales on the markets in the United Kingdom indicates the usual order in which the varieties are shipped and the period of time over which sales of each variety extend (fig. 2). Since most of the apples are harvested in the months of September and October and sold when ready for use, the starting point of the lines indicates approximately the time of maturity for different varieties and the length of the lines their relative keeping qualities.

**Susceptible varieties.**—That certain varieties are more susceptible to slackness of pack than others is evident if the three years used are representative (table 7). No relationship between the time of maturity of the different varieties and slackness is evident. With the exception of Golden Russet, however, there does appear to be a fairly close relationship between keeping

quality as gauged by the length of the line representing distribution of sale and the percentage of barrels classified as slack for a particular variety (fig. 2). Those varieties whose condition does not permit them to be offered for sale for a period longer than six weeks or two months had a relatively high shrinkage.

TABLE 7.—PERCENTAGE OF BARRELS CLASSIFIED AS SLACK ACCORDING TO VARIETY IN NOVA SCOTIA APPLES DURING THE THREE MARKETING SEASONS SOLD AT AUCTION IN LIVERPOOL, 1935-36-37

Variety	Three years' shipments			Per cent slack by seasons		
	Total	Barrels classified as slack		1935-36	1936-37	1937-38
	barrels	No.	p.c.	p.c.	p.c.	p.c.
Red Gravenstein.....	2,172	1,151	53	13	0	73
Northern Spy.....	3,003	1,109	38	51	43	33
Gravenstein.....	16,443	5,105	31	6	2	55
Golden Russet.....	18,946	2,890	15	20	24	3
Ribston.....	1,191	163	14	8	19	12
Wagener.....	11,352	1,240	11	4	26	5
King.....	36,319	2,234	6	2	12	5
Baldwin.....	50,038	2,706	5	3	10	4
Stark.....	51,311	2,165	4	3	14	3
Cox Orange.....	1,286	47	4	0	5	0
Ben Davis.....	21,258	515	2	0	12	5
McIntosh.....	2,719	35	1	1	2	1

**Grade and size.**—A larger proportion of slackness was found in the Domestic grade for 8 out of the 12 standard varieties.<sup>10</sup> Apparently size had no direct or definite influence on the proportion of slack barrels in the pack.<sup>11</sup>

TABLE 8.—PROPORTION OF BARRELS CLASSIFIED AS SLACK TO TOTAL IN CARGOES OF STEAMERS CARRYING APPLES FROM NOVA SCOTIA TO LIVERPOOL DURING THE SHIPPING SEASONS OF 1935-36-37

Month of arrival	Number of steamers		Total barrels	Barrels classified slack	Per cent slack
	Total	Carried barrels classified slack			
	No.	No.			p.c.
September.....	7	4	12,395	5,481	44
October.....	19	16	45,947	2,969	6
November.....	16	13	38,731	2,186	8
December.....	18	16	52,426	5,727	11
January.....	26	16	40,792	1,190	3
February.....	18	2	11,713	62	1
March.....	19	5	13,987	1,645	12
April.....	1	0	27	0	0
Total.....	124	72	216,018	19,260	9

<sup>10</sup> Percentage classified as slack by grade (No. 1-Dom.) Red Gravenstein 48-66, Northern Spy 39-35, Gravenstein 29-37, Golden Russet 14-17, Ribston 10-21, Wagener 8-5, King 5-7, Baldwin 5-6, Stark 4-4, Cox Orange ( $\frac{1}{2}$  brls.) 1-8, Ben Davis 1-4, McIntosh Red 0-0.

<sup>11</sup> Percentage classified as slack by size ( $2\frac{1}{2}$  inches up— $2\frac{1}{2}$  inches to  $2\frac{1}{2}$  inches). Red Gravenstein 53-55, Northern Spy 34-35, Gravenstein 30-14, Golden Russet 12-17, Ribston 8-23, Wagener 11-20, King 6-6, Baldwin 5-6, Stark 5-3, Cox Orange ( $\frac{1}{2}$  brls.) 3-4, Ben Davis 2-4, McIntosh Red 1-1.



**Time of shipping.**—Apples shipped and offered for sale in the month of September showed an extremely high percentage of shrinkage. December with 11 per cent and March with 12 per cent were also considerably higher than other months (table 8). The varieties moving to market in September are the dessert type which come to maturity rapidly and whose keeping qualities are short lived (fig. 2). These varietal characteristics, combined with the high air temperatures which surround the fruit at this season of the year, provide conditions conducive to shrinkage and decay. Heaviest shipments of the year occur in December to meet the active demand for apples which usually precedes the Christmas season. At this time a number of the dessert types of apples are nearing the end of their season. Also Golden Russet and Northern Spy, two of the varieties most susceptible to shrinkage, are shipped in quantity to meet the holiday demand. In March apples still to be marketed from common storage warehouses are in an advanced stage of maturity and the fruit is exposed to higher temperatures than during the winter months.

**Fruit temperature.**—The average temperatures of apples at time of loading on steamers for export at Halifax and Port Williams show a well-defined curve from a high point in September to a low in February (table 32A). During the month of September fruit temperatures ranged from 59 to 67 degrees Fahrenheit.



Easing the platform sling on old rubber tires in the ship's hold to prevent bruising.

**Hold temperatures.**—The average hold temperatures of steamers carrying fruit across the Atlantic show a considerable range in readings throughout the season (table 33A). The seasonal curves show a similar trend and differences between years are small for any sailing period with the exception of the months of September and March. If these three years are representative, then these are the temperature conditions to which apples may be expected to be exposed when crossing the Atlantic in common stowage. Hold temperatures averaged 69 degrees in August and early in September of 1937 and reached a maximum of 74 degrees Fahrenheit during the crossing. The average temperature of the

holds was higher than the temperature of the apples which were stowed in them (tables 32 and 33A). This relationship holds true in nearly every period throughout the shipping season. A comparison of fruit and warehouse temperatures with stowage temperatures over the same period of time leads to the conclusion that air conditions surrounding the apples in common stowage on board ship are even more damaging than in the common storage warehouses (table 6).

**Common stowage temperatures.**—The records of individual shipments show that in certain instances no slack barrels were reported in cargoes of boats with unusually high hold temperatures. On the other hand, slacks have been reported in shipments from boats which unloaded comparatively cool cargoes. When a large number of cases is examined over a period of time, however, the unusual situations are submerged and the average conditions are brought to light. In this study the thermograph records of the hold temperatures of 93 steamers which carried apple cargoes from Nova Scotia to Liverpool were examined. A count was made of the total barrels sold from these steamers and the number classified as slack by a single broker on the Liverpool auction market. A fairly definite association occurs between temperatures and the percentage of slackness in the pack (table 9).

TABLE 9.—PERCENTAGE OF BARRELS CLASSIFIED AS SLACK IN RELATION TO AVERAGE HOLD TEMPERATURE IN TRANSIT FROM NOVA SCOTIA TO LIVERPOOL DURING THREE SHIPPING SEASONS 1935-36-37

Hold temperature		Number of steamers		Barrels sold from steamers		
Grouping	Average and deviation	Total	Carried barrels classified slack	Total	Slack	Per cent slack
°F.	°F.	No.	No.	No.	No.	p.c.
70 and over.....	70—3	1	1	4,468	3,041	65
60 to 70.....	63—4	8	6	10,988	2,124	19
50 to 60.....	56—5	15	8	22,484	996	4
40 to 50.....	45—5	43	22	65,074	4,005	6
30 to 40.....	37—5	25	8	24,711	1,318	5
Under 30.....	27—2	1	1	1,045	683	65
Total.....		93	46	128,770	12,167	9
Unrecorded.....		12	10	13,990	1,664	12
GRAND TOTAL.....		105	56	142,760	13,831	10

Another source of information on ship temperatures was found in the inspection records of the Canadian Government fruit inspectors at Port Williams and Halifax. The inspectors record the hold temperatures of all boats loading perishable products. When the average temperatures were correlated with the percentages of shrinkage as indicated by slackness of the pack, a definite relationship between these factors appeared (table 34A).

A comparison of the results from the two entirely independent sources of temperature data shows a high degree of correspondence. Based on these findings it seems evident that apples held in temperatures of over 60 degrees are exposed to critical conditions and are subject to shrinkage which results in slack barrels and financial loss. Carried within a range of 30 to 55 degrees the

apples delivered on the market showed a relatively low percentage of slackness in the pack. Transit temperatures within these limits should not be impracticable or beyond control.

From one boat with a hold temperature which averaged over 70 degrees, 65 per cent of the apples were designated slack. Another shipment was exposed to temperatures which averaged 27 degrees and fell to a minimum of 25 degrees. From this shipment 65 per cent of the apples were classified as slack (table 9). Such carrying temperatures, obviously, were beyond the range of safety.

**Refrigerated storage.**—Although a small proportion of apples are carried in refrigerated holds each season, it has not been possible to identify these apples at time of sale. In one instance where the whole cargo was carried in refrigerated chambers the shipment was traced through to the auction sales room. In that instance 18 per cent of the apples were classified as slack (table 34A). This single instance does not provide sufficient evidence on which to base a conclusion. It shows, however, that refrigeration is not a guarantee against slackness in the pack and supports the findings of the Empire Marketing Board in 1930. It was then stated: "A high proportion of slacks also occurred in the cold stored barrels of all varieties and some unrefrigerated shipments of Russets, although very little wastage was present. In these cases the slackness was probably caused by shrinkage of the fruit, due to transpiration of moisture."

**Number of days in transit.**—The number of days in transit from Halifax to Liverpool was obtained for 53 steamships. As the average number of days decreased from 13.1 to 8.7 the number of barrels classified as slack decreased proportionately from 9 to 3 per cent (table 35A). In assembling data on which this relationship is based arrivals during September, October and March were discarded in order to avoid the complicating factor of high air temperatures during these months.

**Conclusions.**—The analysis leads to the conclusion that temperature, and slackness of pack which results from shrinkage or wastage are closely associated. Especially is this true in the early part of the fall shipping season. At that time of the year air, warehouse and fruit temperatures at shipping points are relatively high, ships' hold temperatures are high and temperatures to which the apples are exposed when unloaded after nine or ten days in transit are comparatively high. During this period contributing causes to a slack condition occur all along the line of distribution. This study indicates that they accumulate progressively as the apples move from warehouse to market. The air temperatures to which apples are exposed are so closely associated with the slack barrels, it seems important that this phase of the problem be given primary consideration in any program of control.

### Variations in Company Returns

Companies which received a high seven-year average return for all varieties were consistently high for each variety (table 10). In the upper third a company from the eastern limit and a company from the western end of the fruit-growing district are represented and others are scattered between these points. Geographical location reveals nothing of significance and suggests that factors other than soil or location are of paramount influence in explaining the variations in returns to the companies in the study.



TABLE 10.—RANKING OF COMPANIES BY SEVEN-YEAR (1931-37) AVERAGE RETURNS FOR MAIN VARIETIES AND RELATIVE POSITION OF COMPANIES INDICATED FOR EACH VARIETY

Company	Average return	Ranking position of companies by variety		
		Upper third	Middle third	Lower third
	\$	a-b-c-d-e-f-g <sup>1</sup>	a-b-c-d-e-f-g <sup>1</sup>	a-b-c-d-e-f-g <sup>1</sup>
Upper third:				
16.....	2.53	x x x x x x x		
7.....	2.38	x x x x x x	x	
15.....	2.35	x x x x	x x x	
6.....	2.35	x x x x x	x x	
2.....	2.32	x x x x x	x	x
17.....	2.28	x x x x x	x x	
Middle third:				
9.....	2.24	x x	x x x x x	x
12.....	2.19	x	x x x x x x	
4.....	2.18	x	x x x x x x	
13.....	2.15	x x	x x x	x x
10.....	2.11		x x x x	x x x
14.....	2.09	x	x x	x x x x
Lower third:				
11.....	2.09		x x x x	x x x x
18.....	2.08	x x	x	x x x x
8.....	2.00	x	x	x x x x x
5.....	2.00		x x	x x x x x
3.....	1.82			x x x x x x
1.....	1.81			x x x x x x

<sup>1</sup>Varieties corresponding to letters are: (a) Baldwin, (b) Ben Davis, (c) Golden Russet, (d) Gravenstein, (e) King, (f) Ribston, (g) Stark.

**The pack-out.**—The three-year average percentage of tree-run apples graded and packed by 13 companies which allot packing charges on the brought-in basis was 83 per cent compared with 74 per cent for the four companies which operate on a packed-out basis. Certain companies were consistently high for all varieties while others remained in the lower brackets.

A fruit packing company's success is frequently judged by the prices received for its pack on the auction market. The packing house managers receive copies



The fruit packing companies included in the study are owned and the management controlled by growers. Apples are pooled and returns to growers are averaged on the basis of variety, grade and size.

of the auction sales catalogues in which prices realized are quoted for each company in the sale. Naturally there is competition for a favourable position. Such competition is to be commended so long as the growers receive full benefit. The grower's measure of a successful or unsuccessful season is based on the tree-run average which is dependent on the sale price less handling costs and the ratio of pack-out to tree-run. It is the packing-house manager's responsibility to maintain grading standards and at the same time to strive for such balance between sales price and the percentage pack-out as will net the highest possible average return to the grower for all the apples he produces.

The relationship between the percentage pack-out and return to the packing company per barrel of apples packed and shipped indicates that differences in price returns among companies were of minor importance. This suggests that the apples packed and sold were reasonably uniform with respect to minimum standards of quality. On the other hand when the percentage pack-out and the return on a tree-run basis are associated the relationship is direct in nearly every case. That is, the packing-house managers and the fruit inspectors are adhering to fairly uniform standards in culling and low returns to the grower for his orchard run of apples are due in part to low quality of fruit.

**Grade and size.**—Companies which packed a high percentage of large size, No. 1 grade of apples received a relatively high return. It should be the aim of the grower to produce as large a proportion of apples as possible to qualify

TABLE 11.—ASSOCIATION BETWEEN SEVEN-YEAR (1931-37) PERCENTAGES OF APPLES OF LARGE SIZE IN NO. 1 GRADE AND SEVEN-YEAR AVERAGE RETURNS FROM ALL GRADES AND SIZES TO COMPANIES RANKED IN UPPER THIRD, MIDDLE AND LOWER THIRD GROUPS ON PER CENT NO. 1'S OF LARGE SIZE

Variety	Upper third		Middle third		Lower third	
	Per cent large No. 1's	Average return	Per cent large No. 1's	Average return	Per cent large No. 1's	Average return
	p.c.	\$	p.c.	\$	p.c.	\$
Baldwin.....	31.1	2.07	26.2	2.04	16.2	1.84
Ben Davis.....	34.6	1.95	24.1	1.93	18.5	1.82
Golden Russet.....	24.5	3.41	21.1	3.32	16.6	3.36
Gravenstein.....	39.9	1.80	34.1	1.60	28.2	1.56
King.....	52.1	2.33	46.0	2.32	37.3	2.13
Ribston.....	31.7	2.13	26.5	2.02	19.3	1.91
Stark.....	44.5	2.01	37.8	1.97	29.1	1.89

according to grade standards as large size No. 1's. When the companies are ranked with respect to these factors and the percentage of large size No. 1's associated with the average return, a direct relationship is indicated in nearly every case (table 11).

**Warehouse temperatures.**—Temperature control within the common storage apple warehouses to a large extent is associated with management. With a comparatively small outlay of money for ventilating equipment and insulating material a number of well managed companies have been able to show marked improvement in temperature control. Temperature control combined with other management factors has shown its influence on the price return. Although differences in temperature and the price return are not large they indicate that the top-ranking companies have given attention to this important phase of packing-house management. In the typical Nova Scotia apple warehouse, many of which are favourably situated with respect to moving air currents, control can be effected at comparatively low cost.

**Slack barrels.**—In reference to slack barrels a statement in the 1926 report of the Imperial Economic Committee will bear repeating,—

Many causes contribute to the production of "slacks," such as inefficient packing, the break down of over-ripe apples in transit, rough handling at points of embarkation and discharge. Some of these causes are, manifestly, beyond the control of the shipper. It is a fact, however, that the most efficient packers do succeed in landing their apples with slack packs reduced to a minimum, and that, if the average of efficiency in packing were raised to the level attained by these, the resulting saving from the enhanced values of the fruit would add very considerably to the returns received.

The findings of this survey support the statement to the extent that a relationship was found between the percentage of slacks and the price return to the companies (table 36A).

### **Selling and Transportation Costs**

The usual method of selling Nova Scotia apples is by open consignment through a fruit broker at auction or through a commission agent by private treaty arrangement. The prices received in private treaty sales follow auction levels very closely. Between these two methods there is very little difference in selling charges but among individual brokers and commission agents of each type there is some variation. Typical charges at Liverpool are a handling rate of 1s. 6d. per barrel plus a commission of 3 per cent on sales. In London the usual handling charge is 1s. 7d. per barrel together with a commission rate of 5 per cent on sales. Little information is available on a breakdown of the consolidated handling charge. Usually brokers and commission agents show no accounting of the various items of expense within the charge in their accounts of sale. A few give a partial breakdown but in most instances there is an unexplained portion left, usually under the heading "our charges."

That rebates from the consolidated charges are made in varying amounts to some fruit packing houses is a well-known fact. These lead to suspicion and to what is regarded by the shippers as unfair competition in distribution and sale. The shippers generally do not like the system and from their point of view the implementation of the Imperial Economic Committee recommendation of 1926 is greatly to be desired. At that time the Committee recommended,— "that consolidated handling charges should be capable of detailed and satisfactory analysis into the several items of out-of-pocket expenses, and that such analysis should always be available to the shipper. Further, we think that the commission should be sufficient to cover all other expenses incurred in connection with the business." The practice gives another explanation for certain variations in returns to packing companies which are possible of control in part, at least.

**Differences in markets.**—The variations in handling and selling costs among markets is small (table 37A). The costs in London are higher due to the longer distances from the docks to sales rooms and the custom of applying special market tolls.

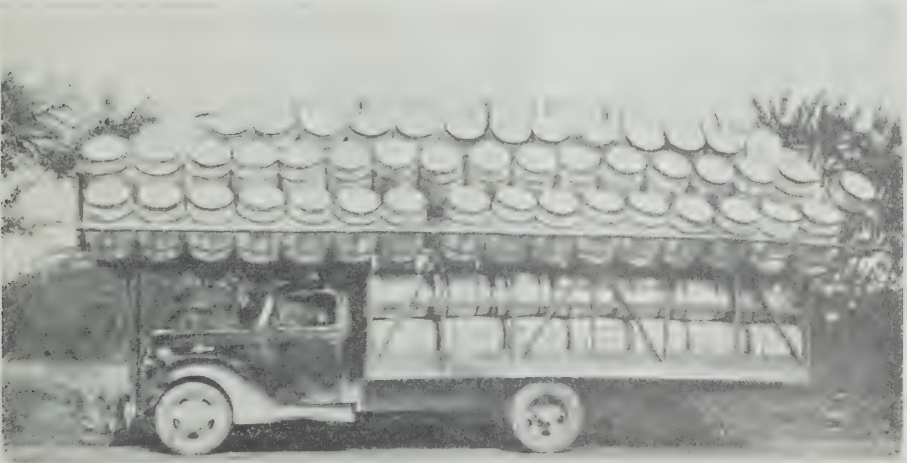
**Differences among years of sale.**—Prices and returns for Nova Scotia apples fluctuate widely from year to year. The many factors which enter into the determination of a price for a barrel of apples at one time compared with another will not be discussed here. Under fair competition prices are arrived at by the interaction of forces acting freely on the supply side and the demand side of the market. It is assumed in this study that the situation just described exists on the overseas markets and observations at this distance confirm such an assumption.



The fluctuations in returns to the packing companies from one year to the next are greater than the fluctuations at the point of sale. This is due to the rigidities in the costs of distribution in which changes are relatively small. When they do change there is a lag behind prices of primary products. This lack of synchronization reacts with severity on the producer, in this case the apple grower, when apple prices decline. On the other hand when prices advance it should be pointed out that the grower stands to benefit.

The factors which make up the distribution costs for apples and determine the spread between the sales price and the return to the shipper are definitely measurable. Among the factors are the rates of exchange on sterling, overseas handling charges and commissions, ocean freight rates, rail transportation rates and other local charges (table 38A). With the exception of the exchange rate all of these costs are within the control of agencies handling the apples for the fruit grower. Distribution charges provide services for which the grower expects to pay. It is in the interest of all that the costs be equitable.

Total charges against a barrel of apples from shipping point in Nova Scotia to the time of primary sale in the United Kingdom averaged \$1.30 during the seven years 1931 to 1937. This amounted to a deduction of 34 per



A load of 305 empty barrels on way to the orchard. The Nova Scotia soft wood barrel with split birch hoops costs the grower about 30 cents.

cent from the average selling price or in other words the apple-packing companies received 66 cents out of each dollar of sale (table 39A). From this return packing and handling costs were deducted before final settlement was made in the form of a net return to the grower. In the 1937-38 season the net return to the grower in Nova Scotia amounted to 59 per cent of the wholesale price on the United Kingdom market.

**Ocean and rail freight.**—Transportation is the heaviest item of cost in the movement of a barrel of apples from shipping point to market. During the seven years 1931-37 ocean and rail freight combined accounted for deductions of approximately 20 per cent from the sales prices.

A discussion of the bases of rate-making is beyond the scope of this enquiry. From the standpoint of the apple growers the study does call attention, however, to the inequitable effects of their operations in the years 1931-37. It may be observed in a number of cases that rates were increased following a season of improved prices and lowered after a decline in prices (table 40A). To the extent that ability to pay on the part of the grower enters into rate making it would be more equitable to use the season's outlook as a basis rather than the experiences of the year that has gone by.

### Warehousing and Packing Costs

All of the 18 companies included in the study are of the joint stock type with limited liability to shareholders. Eleven companies use the services of central agencies for marketing their fruit while four companies ship independently. The companies are not co-operative in name but all have co-operative characteristics in their organization and plan of operation. The companies are owned and the management controlled by growers. In a number of companies the stock is closely held and membership is restricted. Voting in all is on a share basis. In all companies the apples are pooled and returns to growers are averaged on the basis of variety, grade and size.

**The operating statement.**—An accounting of the costs of services which the packing companies render to their patrons is to be found in their statements of operations. When the statements are arranged on a comparative basis wide variations appear (table 41A). The average provides a yard stick from which variations may be measured and where possible and practicable corrective measures applied. On the average companies returned 85 per cent of the shipping point price of apples to producers. The high company returned 90 per cent and the low company 82 per cent. The average gross margin on handling supplies was 8.6 per cent and varied among companies from 4 per cent to 12 per cent.

**The balance sheet.**—The balance sheets and statements of surplus of the packing companies indicate a range in financial soundness from a condition of strength to the point of precariousness (tables 42A and 43A). Too frequently the grower patrons take an impersonal view of the operations of their company. In order to hold their patronage the management is forced to operate on such narrow margins that nothing is available for reserve or payment of debts. Members of a co-operative fruit company must realize that the warehouse is as much a part of their property and business as the orchard and requires just as fair treatment and business-like handling.

TABLE 12.—AVERAGE COST OF PACKING 100 BARRELS OF APPLES ON A TREE-RUN BASIS FOR FIFTEEN FRUIT PACKING COMPANIES IN NOVA SCOTIA FOR THE SEASON 1937-38

	Average for all companies	Cost per 100 barrels		
		Average	High <sup>1</sup>	Low <sup>1</sup>
	\$	\$	\$	\$
Packing room wages.....	3,374	13.64	20.42	10.62
Packing room supplies.....	761	3.16	4.99	1.65
Management and office salaries.....	1,353	5.47	14.95	1.81
Taxes, site rental and storage hired.....	299	1.21	2.63	0.33
Insurance.....	306	1.24	3.21	0.47
Repairs and maintenance.....	186	0.76	2.18	0.00
Light, power, fuel and water.....	202	0.82	1.72	0.29
Office expense.....	205	0.83	5.46	0.37
General expense <sup>2</sup> .....	355	1.44	6.01	0.21
Depreciation.....	795	3.22	7.82	1.92
Interest.....	760	3.07	9.56	1.42
Total cost (without deductions).....	8,616	34.86	55.74	26.34
Miscellaneous income.....	944	3.83	11.85	0.00
Cost less miscellaneous income.....	7,672	31.03	43.89	24.61
Profit on trading.....	1,002	4.05	10.54	-4.04
Net cost of packing apples.....	6,670	26.98	47.93	18.62

<sup>1</sup>Each item may apply to a different company.

<sup>2</sup>General expense includes all items of expenses other than those listed.

**Cost of packing.**—The average cost of packing on a tree-run basis was 27 cents per barrel (table 12). Costs varied among companies from 48 cents to 19 cents a barrel. The large differences between the high items and the averages indicate that certain companies may not be giving the best possible service to their patrons and that substantial savings may be made.

**Cold storage costs.**—Three companies included in this study are equipped with facilities for the cold storage of apples. The period of operation of the cold storage plant is usually from September 15 to December 15, depending on the season. Fall varieties of apples are placed in cold storage and when space is available other varieties are included. For that reason costs are shown in two ways, first when distributed over all varieties of apples handled and secondly when charged against fall apples only (table 45A). The varieties included as fall apples are those recommended for cold storage by the Dominion Experimental Station at Kentville.

In separating cold storage costs from other costs the apportionment of expenses as shown in the books of the companies was used for items of direct cost. This applied to wages, supplies, insurance and power. Depreciation was charged at the rate of 10 per cent of the value of cold storage equipment. Interest was charged at 5 per cent on the investment in the cold storage plant. Depreciation and interest charges are shown in two ways. First they are applied on the total cost of the cold storage plant and equipment and secondly they are apportioned to the total cost less the government subsidy. The latter calculation represents the net cost to the company.

### **Comparative Costs and Returns for Cold and Common Apple Storage Houses**

The average cost of handling, storing and packing by the companies equipped for cold storage when depreciation and interest were charged on the subsidized portion of the plant was 36 cents per barrel, in the season 1937-38. When no depreciation or interest were charged on the amount of the subsidy the cost averaged 31 cents per barrel. In comparison with these figures the common storage companies handled their packing and storing operations at an average cost of 26 cents per barrel (table 46A). For the same season the gross return to the packing companies for 12 standard varieties on a tree-run basis averaged \$2.10 per barrel for the cold and \$2.22 for the common storage companies. After handling, storing and packing costs were deducted the cold storage companies returned an average of \$1.74 or \$1.79 per barrel to their grower patrons depending on how depreciation and interest charges were apportioned. In comparison the net return to patrons of the common storage companies was \$1.96 per barrel (table 47A). When the comparison was extended to a seven-year average the cold storage companies received a higher return for 5 out of the 12 varieties with the most definite improvement being shown in the Ribston and Cox Orange varieties (table 13). When a simple average was taken of the prices per barrel by variety a gross return of \$2.55 was obtained for each type of storage. Since the cost of cold storing averaged 4 or 9 cents per barrel the net return to the grower patrons of the cold storage companies is reduced by approximately that amount when compared with the net return through common storage houses.



TABLE 13.—AVERAGE RETURN PER BARREL ON A PACKED-OUT BASIS FROM TWELVE STANDARD VARIETIES SHIPPED THROUGH COLD AND COMMON STORAGE WAREHOUSES THROUGHOUT THE SEVEN YEARS 1931-37

Variety	Average return per barrel	
	Cold	Common
	\$	\$
Baldwin.....	2.06	2.16
Ben Davis.....	1.98	1.96
Golden Russet.....	3.62	3.59
Gravenstein.....	1.75	1.78
King.....	2.31	2.36
Ribston.....	2.28	2.18
Stark.....	2.02	2.12
Cox Orange (half barrels) <sup>1</sup> .....	2.63	2.40
Red Gravenstein <sup>1</sup> .....	3.06	3.31
McIntosh Red <sup>1</sup> .....	3.45	3.00
Northern Spy <sup>1</sup> .....	2.72	2.86
Wagener <sup>1</sup> .....	2.74	2.83
All.....	2.55	2.55

<sup>1</sup>Based on four-year average.

**Slack barrels and type of storage.**—A count of slack barrels in the auction sales catalogues and on the account sales indicated that cold storage treatment in the warehouses in Nova Scotia did not overcome shrinkage or wastage in apples which resulted in slack barrels. The reports showed 8 per cent classified as slack in the shipments from cold storage companies compared with 5 per cent slack out of common storage.

**Possibilities of temperature control in common storage warehouses.**—The effectiveness of temperature control in the common storage apple warehouses is dependent on the outside air temperature. A study of meteorological records at the Dominion Experimental Station at Kentville in the centre of the fruit area provided information on atmospheric temperatures for the 10 years 1928 to 1938. This analysis was undertaken to find out what possibilities for temperature control existed during the fall months of the year. About half the days in September and nearly all of October and November normally permit cooling by use of outside atmosphere at temperatures below 50° Fahrenheit (table 14).

TABLE 14.—MINIMUM FALL TEMPERATURES AT THE DOMINION EXPERIMENTAL STATION, KENTVILLE, NOVA SCOTIA, THROUGHOUT TEN YEARS, 1929 TO 1938

Month	Average days per month below stated minimum temperature			
	Under 40°	Under 45°	Under 50°	Over 50°
September.....	5	11	16	14
October.....	17	22	27	4
November.....	25	28	29	1

A number of well managed companies appear to be making fairly effective use of outside air in controlling temperatures within their warehouses. Others are not taking full advantage of the possibilities for control and the effect on their apple pack is reflected in the price returns.

Companies which are giving close attention to temperature control keep the warehouse closed when the outside air temperature is higher than that within the warehouse. Fruit hauled to the warehouse during the heat of the day is stacked on screened platforms to be stored the following morning. This practice takes advantage of the cooler night air to remove some of the orchard heat in the apples.

***A consideration of the benefits of existing cold storage facilities.—***

Between 1930 and 1934 four companies operating in the heavier producing sections of the Annapolis Valley fruit area qualified for assistance under the Cold Storage Act and installed cold storage equipment. Since that time two other companies reconditioned their common storage warehouses and installed cold storage facilities. Other companies are considering taking advantage of the assistance offered. Since the subsidy is usually large enough to cover the purchase and installation of equipment the question left to be considered is whether or not increased returns will cover operating costs and depreciation.

Based on this analysis the growers shipping apples through cold storage companies have added costs which did not improve their returns in relation to patrons of common storage warehouses. If the assumption that companies are comparable on all factors other than cold storage is correct the apparent conclusion to be drawn is that cold storage as applied in the warehouses under consideration has not been a benefit to the patrons of the cold storage companies. The conclusion raises a question as to the type of equipment installed and the use made of the equipment. A decision on that question is beyond the scope of this enquiry. A study of the problem by a competent refrigeration engineer seems highly desirable and needed before more money is invested in cold storage facilities.

Companies equipped with cold storage facilities are expected to be in a position to hold supplies off the market during the seasonal rush for a price advantage at a later date. A comparison was made for the three seasons 1935-37 of the average seasonal distribution of apple shipments by cold and common storage warehouses. The cold storage companies appear to have effectively extended the period of marketing for a number of varieties (table 15).

TABLE 15.—COMPARISON OF THE AVERAGE SEASONAL DISTRIBUTION OF SHIPMENTS FOR FIVE VARIETIES OF APPLES BY COMPANIES EQUIPPED WITH COLD STORAGE AND COMMON STORAGE FOR THE THREE SEASONS 1935, 1936 AND 1937

Variety and type of storage	Total shipments	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
	barrels	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.
Gravenstein:								
Cold.....	19,118	90	10					
Common.....	19,442	95	5					
King:								
Cold.....	19,132	12	67	18	1	2		
Common.....	14,126	6	94					
Cox Orange (half barrels):								
Cold.....	13,975	32	29	21	17	1		
Common.....	11,538	60	40					
Ribston:								
Cold.....	21,680	23	33	34	10			
Common.....	17,770	31	55	11	3			
Golden Russet:								
Cold.....	15,158		2	27	15	32	23	1
Common.....	12,518		3	49	23	23	2	
Five varieties:								
Cold.....	82,076	33	29	20	7	6	4	1
Common.....	66,625	41	38	12	5	4	1	

To the extent that the cold storage companies withheld supplies during marketing peaks the whole industry benefited, but this general gain appears to have been at the expense of the cold storage company patrons. For many varieties apples out of cold storage did not command as high an average price as the fresher fruit. Further, the holding of apples adds to expenses due to extra overhead costs and loss from shrinkage. If cold storage is a benefit to the industry then the additional costs for such service might be distributed more equitably over all producers in the commercial apple growing area of the province.

### *Factors Influencing Costs of Packing and Net Returns*

The wide variations in costs of packing among 15 apple packing companies in 1937-38 indicate differences in the efficiency of plant operation. This is largely a management problem. All prices, costs and services of the packing companies should be considered in the light of efficient operation and a profitable return to the grower. Every added cost or service which a packing company undertakes must be examined and tested from that aspect.

A number of packing houses which have increased their costs relative to others by installing ventilating equipment and such facilities as hydraulic presses or by paying a larger wage for a higher quality of labour have been compensated



Companies which are giving close attention to temperature control keep the warehouse closed when the outside air temperature is higher than that within the warehouse. Fruit hauled to the warehouse during the heat of the day is stacked on platforms to be stored the following morning. This practice takes advantage of the cooler night air to remove some of the orchard heat in the apples.

in the returns received. In order to have full significance, costs must be related to returns. A number of companies which had higher costs apparently did a better job of packing and in the final test returned more to the grower. For other companies high costs indicated inefficient operation and the returns received by the growers were relatively low.

The volume in barrels times the packing charge determines the revenue from packing apples. Since the packing charge must be limited if patronage is to be maintained, a small volume of apples results in a proportionally small income. An analysis of costs shows that among the smaller packing houses controllable costs such as repairs and packing supplies were reduced but the inescapable costs of interest, depreciation and to a lesser extent wages were burdensome charges on each grower's barrel of apples. In the small companies labour cannot be used efficiently and its cost is relatively high.



It appeared that companies handling 15,000 barrels and over formed a comparatively efficient unit for operation. The companies in the low-volume group required practically the same equipment for grading and handling one-third to one-half the quantity of apples. Low capacity, high costs and unprofitable operation have been experienced by the small companies. Under such a combination of adverse factors a sound financial condition as indicated by the net worth position and other financial ratios has not been maintained.

The companies which handled the largest number of barrels per square yard of floor space had the lowest costs of packing (table 16). Companies which handled 12 barrels per square yard of floor space had an average cost of packing of 28 cents a barrel. For companies which handled 5 barrels per square yard costs rose to 40 cents a barrel.

TABLE 16.—RELATIONSHIP BETWEEN BARRELS HANDLED PER SQUARE YARD OF FLOOR SPACE, THE COST OF PACKING AND THE NET RETURN

Company grouping	Barrels handled per square yard	Average volume handled	Cost of packing per barrel	Cost as per cent of gross return	Net return for grower per barrel
	barrels	barrels	cts.	p.c.	\$
Upper third.....	12.4	40,592	27.58	13.6	1.79
Middle third.....	9.1	25,150	33.47	17.0	1.70
Lower third.....	5.2	8,439	39.82	25.2	1.29

The amount of business which a company did in relation to the value of its plant and equipment had a direct and important influence on the cost of packing (table 17). The amount of business included returns from sales of apples and the gross sales value of supplies. Among the companies the ratio varied from a high of \$11.02 of business to \$1 of plant value to a low of \$1.52 to \$1. The cost of packing for the former company was 18.62 cents per barrel and the latter 41.72 cents. The net return for the grower was \$1.90 and \$1.36 per barrel respectively. Only one of the three companies operating retail stores was among the companies in the upper third group.

TABLE 17.—RELATIONSHIP BETWEEN THE RATIO OF BUSINESS TO PLANT VALUE, THE COST OF PACKING AND THE NET RETURNS

Company grouping	Business per dollar of plant value	Cost of packing per barrel	Cost in per cent of gross return	Net return for grower per barrel
	\$	cts.	p.c.	\$
Upper third.....	8.39	24.34	11.9	1.80
Middle third.....	4.81	30.97	15.8	1.69
Lower third.....	2.17	38.17	24.6	1.29

The effect of a low business turn-over is clearly shown in the relatively high costs and low returns to members. This analysis indicates that growers in the low group are losing 20 to 30 cents a barrel or a total of approximately \$10,000 each year when their returns are compared with those in the middle group. That is too much to pay for loyalty. If investment is at stake the growers must decide between a present loss and chances for future gain through association

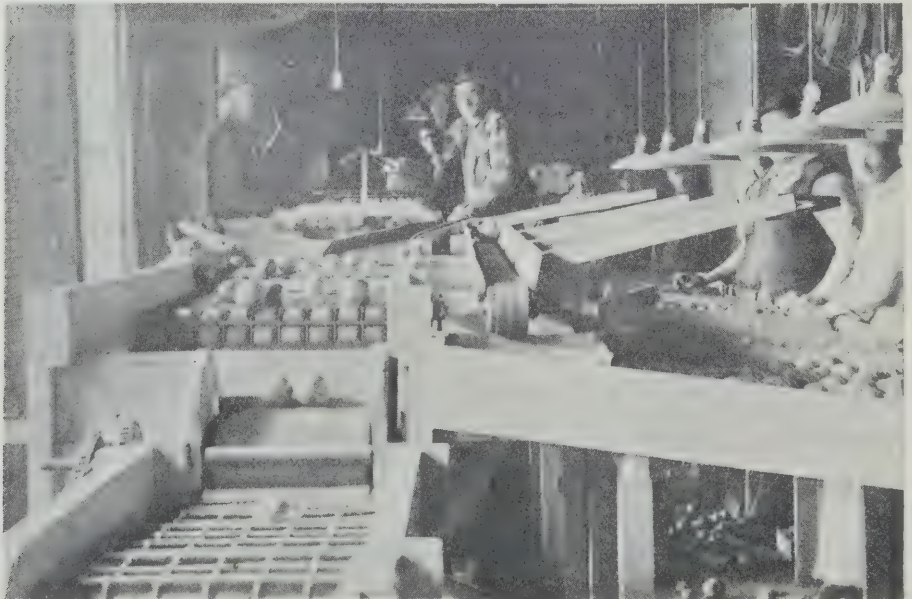
with a strong company, or a continuation of low returns. There appears to be little prospect of these companies increasing their business so long as they remain independent operating units.

Wages and salaries which make up over 50 per cent of the total costs of packing had a direct relationship to costs. When related to the price paid to the grower it was found that the companies paying the lowest wages and salaries did not obtain as high a price for their product nor return as much to their growers as the middle group. Companies which endeavour to economize in salaries and wages usually get what they pay for and the job of packing is poorly done. It is in the growers' interest to employ efficient management and labour even though the cost may be somewhat higher.

The amount of interest on borrowed funds which is charged against each barrel of apples is an indicator of a company's financial solvency and efficiency of operation (table 18). Among the companies studied this varied from 1.23 cents a barrel to 23.71 cents a barrel. Debts on which interest was charged varied from 5 cents a barrel to \$4.33 a barrel.

TABLE 18.—RELATIONSHIP BETWEEN THE INTEREST EXPENSE, COST OF PACKING AND THE AVERAGE RETURN

Company grouping	Interest per 100 barrels	Cost of packing per 100 barrels	Cost in per cent of gross return	Average net return
	\$	\$	p.c.	\$
Upper third.....	2.15	26.11	13.2	1.74
Middle third.....	3.96	29.91	15.4	1.66
Lower third.....	12.42	37.46	23.8	1.37



Companies handling 15,000 barrels and over formed a comparatively efficient unit for operation. The companies in the low-volume group required practically the same equipment for grading and handling one-third to one-half the quantity of apples. High costs and unprofitable operation have been experienced by the small companies.

The debts of the fruit companies have been accumulating over a number of years. Under usual conditions the process of liquidating them takes time and sacrifice. If liabilities are to be reduced, the companies must increase their operating margins, for debts can only be paid out of earnings in a "going concern." This means a lower return for the growers from companies which have been carrying on their business with borrowed funds (table 18).

Some companies do not write off depreciation, which includes obsolescence, as an operating expense chargeable to the year's business. This does not mean that they have escaped the cost, for depreciation and obsolescence are as certain as time. It is an expense which must be paid sooner or later as buildings and equipment inevitably wear out and become obsolete. For companies which have a small business turn-over in relation to the investment in plant and equipment the charge is relatively heavy.

Interest arises from debt and debt is closely associated with volume of business (table 19).

TABLE 19.—RELATIONSHIP BETWEEN THE RATIO OF BUSINESS TO PLANT VALUE, DEBT AND INTEREST

Company grouping	Business per 100 dollars of plant value	Debt per 100 barrels	Interest charge per 100 barrels
	\$	\$	\$
Upper third.....	839	68.35	3.03
Middle third.....	481	96.23	4.50
Lower third.....	217	224.51	11.00

The prospect is not bright for the companies with relatively heavy debt and high interest cost to increase their business and thus distribute these fixed costs. Companies in heavy debt cannot attract new business yet that is the only means by which they can regain financial strength.

Since 1932 the Nova Scotia Government through the Co-operative Fruit Growers' Finance Company has provided assistance by the guarantee of long-term loans to a number of apple packing companies which have qualified for such assistance. Repayment of loans is on the amortization plan covering a period of 30 years. Refinancing under this plan has been a benefit to a number of companies for it has consolidated their debts and in several instances has relieved the directors of company liabilities which they had secured by their personal signatures. This plan is to be commended but it does not solve the problem of getting new business. For a number of companies new business is the urgent need if costs are to be reduced and returns to the growers increased.

In all tests of economy of operation and financial soundness certain companies were in a relatively weak condition. These relationships give additional light on the reasons for variations in the net returns to producers. If the growers affiliated with inefficient companies are going to help themselves into a better economic position, a constructive financial policy is necessary. A rise in prices would undoubtedly assist members of the debt-burdened companies but would not improve their relative positions. Any program based on the hope of a rise in apple prices sufficiently high to restore financial security is a remote and indefinite speculation. Where there is over-accommodation of plant and equipment with no prospect of increasing business, members would be better off in the long run to liquidate their assets even at immediate and considerable loss, and associate themselves with a strongly organized company.



### Sources of Basic Data

*Prices.*—From catalogues of fruit auction sales in the United Kingdom.

*Returns for apples.*—From books and accounts of packing companies, collected by A. E. Richards, Agricultural Economist, W. F. Chown, Chartered Accountant and Senior Assistant Agricultural Economist, and J. E. O'Meara, Agricultural Assistant.

*Warehousing and packing cost data.*—From books of companies, collected by W. F. Chown.

*Air temperatures in the Annapolis Valley.*—From the Dominion Experimental Station, Kentville, Nova Scotia, which is situated in the centre of the apple growing region and considered representative of a large section of the area in fruit.

*Warehouse temperatures.*—From Canadian Government inspection certificates recorded by the fruit inspector at time of loading.

*Hold temperatures of steamers at port of sailing.*—From port inspection records.

*Fruit temperatures.*—From Canadian Department of Agriculture fruit inspectors' reports.

*Hold temperature in transit.*—From blue prints of thermograph records placed under lock in certain holds of steamers at Nova Scotia ports by fruit inspectors and removed by an official of the Dominion Department of Agriculture at Liverpool.

*Air temperatures and relative humidity at Liverpool.*—From the Meteorological Office, Air Ministry, London, England.

*Statistics on tight and slack barrels.*—From the auction sale catalogues of a fruit brokerage firm at Liverpool, England.

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## APPENDIX

TABLE 20.—NUMBER OF APPLE TREES IN CANADA AND NOVA SCOTIA FOR CENSUS YEARS 1901 TO 1931

Census year	Canada		Nova Scotia		Nova Scotia as per cent of Canada
	Apple trees	Per cent change	Apple trees	Per cent change	
	No.	p.c.	No.	p.c.	p.c.
1901					
Bearing.....	11,025,789	100.0	1,203,745	100.0	10.9
Non-bearing.....	4,028,086	100.0	771,830	100.0	19.2
Totals.....	15,053,875	100.0	1,975,575	100.0	13.1
1911					
Bearing.....	10,617,372	96.3	1,596,056	132.5	15.0
Non-bearing.....	5,599,804	139.0	884,984	114.7	15.8
Totals.....	16,217,176	107.7	2,481,040	125.6	15.3
1921					
Bearing.....	9,794,234	88.8	1,835,505	152.5	18.7
Non-bearing.....	2,668,098	66.2	301,931	39.1	11.3
Totals.....	12,462,332	82.8	2,180,739	110.3	17.5
1931					
Bearing.....	8,303,866	75.3	1,824,600	151.6	22.0
Non-bearing.....	2,085,010	51.8	367,253	47.6	17.6
Totals.....	10,821,342	71.9	2,231,824	112.9	20.6

Source: Seventh Census of Canada, 1931.

TABLE 21.—TOTAL PRODUCTION OF APPLES IN CANADA BY PROVINCIAL GROUPING

Year	Canada	British Columbia	Ontario Quebec and New Brunswick	Nova Scotia	Nova Scotia as per cent of Canada
	barrels	barrels	barrels	barrels	p.c.
1931.....	3,909,400	1,181,500	1,216,600	1,511,300	39
1932.....	4,164,400	1,730,100	1,218,500	1,215,800	29
1933.....	5,797,900	1,605,000	1,430,200	2,762,700	48
1934.....	4,696,100	1,801,400	753,000	2,141,700	46
1935.....	4,505,900	1,714,900	985,000	1,806,000	40
1936.....	4,020,900	1,541,700	823,500	1,655,700	41
1937.....	5,057,300	1,932,800	971,900	2,152,600	42
1938.....	5,222,400	2,016,200	1,015,500	2,190,700	42

Source: Dominion Bureau of Statistics, Ottawa, Canada.



TABLE 22.—UTILIZATION OF NOVA SCOTIA APPLE CROP 1931 TO 1938

Year	Production	To processing plants	Commercial pack	Total exports	Exports to United Kingdom	Domestic disappearance
	barrels	barrels	barrels	barrels	barrels	barrels
1931-32.....	1,511,300	183,781	1,327,500	1,219,025	1,072,303	108,475
1932-33.....	1,215,800	262,342	953,400	886,994	861,042	66,406
1933-34.....	2,762,700	424,238	2,338,400	2,267,678	1,886,347	70,722
1934-35.....	2,141,700	452,012	1,689,700	1,333,427	1,175,000	356,273
1935-36.....	1,806,000	285,966	1,520,000	1,374,879	1,349,999	145,121
1936-37.....	1,655,700	571,818	1,083,900	822,650	658,539	261,250
1937-38.....	2,152,600	584,726	1,567,900	1,301,534	1,197,600	266,366
1938-39.....	2,190,700	251,053	1,939,600	1,772,011	1,578,437	167,636

Source: Dominion Bureau of Statistics, Ottawa, Canada.

TABLE 23.—PROPORTIONS OF NOVA SCOTIA APPLE CROP UTILIZED IN PROCESSING PLANTS AND PACKED FOR SALE AS FRESH FRUIT

Year	Production	To processing plants	Sold as fresh fruit
	barrels	p.c.	p.c.
1931-32.....	1,511,300	12	88
1932-33.....	1,215,800	22	78
1933-34.....	2,762,700	15	85
1934-35.....	2,141,700	21	79
1935-36.....	1,806,000	16	84
1936-37.....	1,655,700	35	65
1937-38.....	2,152,600	27	73
1938-39.....	2,190,700	11	88

TABLE 24.—NUMBER OF VARIETIES AND PROPORTION EXPORTED FROM NOVA SCOTIA

Year	TOTAL		GROUPS OF VARIETIES					
	Varieties	Exports	Main	Per cent exported	Other Main	Per cent exported	Odd	Per cent exported
	No.	barrels	No.	p.c.	No.	p.c.	No.	p.c.
1933-34.....	150	2,267,678	12	74	5	12	133	14
1934-35.....	197	1,333,427	12	74	5	17	180	9
1935-36.....	120	1,374,879	12	79	5	12	103	9
1936-37.....	117	822,650	12	78	5	16	100	6
1937-38.....	179	1,301,534	12	78	5	13	162	9

Source: Records from Fruit and Vegetable Division, Marketing Service, Department of Agriculture, Ottawa.

TABLE 25.—UNITED KINGDOM TOTAL SUPPLIES, DOMESTIC PRODUCTION OF APPLES, TOTAL IMPORTS AND IMPORTS FROM NOVA SCOTIA 1931 TO 1938

Year	Total supplies	Production (culinary and dessert)	Total imports September 1 to March 1	Imports from Nova Scotia
	barrels	barrels	barrels	barrels
1931-32.....	6,549,438	1,335,408	5,214,030	1,072,303
1932-33.....	6,611,500	2,134,045	4,477,455	861,042
1933-34.....	6,906,773	2,551,500	4,355,273	1,886,347
1934-35.....	9,760,227	6,838,045	2,922,182	1,175,000
1935-36.....	5,647,621	1,202,409	4,445,212	1,349,900
1936-37.....	7,418,144	5,346,083	2,072,061	658,539
1937-38.....	5,784,596	2,130,545	3,654,051	1,197,600
Average.....	6,954,042	3,077,148	3,877 181	1,171,547

Source: Imperial Economic Committee, Report, Apples and Pears 1938, p. 137; Fruit Supplies 1937, pp. 13 and 24; Weekly Intelligence Notes, May 18, 1938, p. 12, published London, England.

TABLE 26.—WEEKLY IMPORT ARRIVALS OF APPLES FROM NOVA SCOTIA, CANADA AND ALL COUNTRIES AT LIVERPOOL AND WEEKLY IMPORT ARRIVALS ON ALL MARKETS IN THE UNITED KINGDOM EXPRESSED AS A PERCENTAGE OF THE AVERAGE WEEKLY IMPORTS FROM SEPTEMBER TO MARCH IN THE SEASON 1937-38

Week of	Import arrivals at Liverpool			Import arrivals on all markets in United Kingdom
	Nova Scotia	Canada	All countries	
	p.c.	p.c.	p.c.	p.c.
September 5.....		4	38	19
12.....	134	110	77	36
19.....	65	66	84	90
26.....	92	186	180	103
October 3.....	152	132	149	134
10.....	229	126	161	132
17.....	118	203	215	167
24.....	148	104	81	91
31.....		123	180	145
November 7.....	139	169	127	115
14.....	211	78	136	162
21.....	146	181	141	136
28.....	231	220	185	112
December 5.....	91	35	110	170
12.....	247	191	167	99
19.....		49	45	72
26.....		48	49	49
January 2.....	74	66	75	70
9.....	53	51	58	124
16.....	143	160	143	115
23.....	48	49	51	90
30.....	51	110	132	99
February 6.....	65	45	51	86
13.....	36	80	102	76
20.....	26	46	54	62
27.....	24	91	103	78
March 6.....	20	28	72	66
Average deviation.....	59	51	44	31
Total barrels.....	409,532	676,630	1,124,277	4,002,476
Weekly average (barrels).....	15,751	24,165	40,153	148,240

Source: Weekly Fruit Intelligence Notes, Imperial Economic Committee, London.

TABLE 27.—COMPOSITE INDEX OF WEEKLY AVERAGE PRICES OF NO. 1 LARGE (2½" UP) FOR EIGHT STANDARD VARIETIES AT LIVERPOOL COMMENCING THE THIRD WEEK OF SEPTEMBER IN EACH YEAR 1935-36-37

(Average price for season = 100)

Month and week of sale		1935-36	1936-37	1937-38
September	2nd week*	129	106	121
	3rd "			107
	4th "	80	94	84
October	1st "	89	132	90
	2nd "	91	104	90
	3rd "	89	108	88
	4th "	91	103	97
November	1st "	92	94	
	2nd "		96	105
	3rd "	106	101	101
	4th "	106	100	105
December	1st "	107	107	104
	2nd "	110	106	99
	3rd "	102	107	98
	4th "	110		90
	5th "	96	126	
January	1st "	102	89	100
	2nd "	103	90	100
	3rd "	94	96	95
	4th "	89	82	98
February	1st "	95	101	98
	2nd "	107	97	99
	3rd "	109		110
	4th "	106		105
March	1st "	106	105	108
	2nd "	101	109	108
	3rd "	108	123	108
	4th "	99		107
April	1st "			113
Average deviation.....		8	9	7

Source: Basic data from auction sales catalogue, Liverpool.

\*Corresponds to week of September 15, 13 and 12 in years 1935, 1936 and 1937, respectively.



TABLE 28.—AVERAGE OF WEEKLY PRICE INDICES OF NO. 1 LARGE (2½" UP) STANDARD VARIETIES AT LIVERPOOL ASSOCIATED WITH WEEKLY SUPPLIES OF ALL VARIETIES OF APPLES FROM NOVA SCOTIA, CANADA AND ALL COUNTRIES AT LIVERPOOL AND WITH ARRIVALS AT ALL PORTS IN THE UNITED KINGDOM DURING THE SAME WEEK IN 1935-36-37

(Average price for each season = 100)

Supplies as per cent of average	Average of price indices associated with supply			
	From Nova Scotia at Liverpool	From Canada at Liverpool	From all countries at Liverpool	From all countries at all ports in the United Kingdom
200 and over.....	99	96	94	.....
150 to 200.....	96	98	96	95
100 to 150.....	101	100	101	101
50 to 100.....	102	104	103	102
Under 50.....	107	103	108	112
Number of price observations associated with supply				
200 and over.....	9	9	5	1
150 to 200.....	8	12	10	12
100 to 150.....	15	13	19	22
50 to 100.....	20	24	33	33
Under 50.....	17	13	4	3
Total observations.....	69	71	71	71
Total barrels.....	1,026,821	1,479,028	2,627,171	8,920,096

Source: Basic data from auction sales catalogues and Fruit Intelligence Notes, Imperial Economic Committee, London, Eng.

TABLE 29.—PRICE DIFFERENCE FOR NO. 1 LARGE SIZE (2½" UP) BALDWINS ON VARIOUS MARKETS COMPARED WITH LIVERPOOL FOR THE SAME WEEK OF SALE IN 1937-38

Week of	Liverpool		Deviation from Liverpool average price at				
	Price	Range	London	Man- chester	New- castle	Cardiff	Hull
	s d	d	d	d	d	d	d
Nov. 7.....	17 6	0	- 6	.....	15	6	.....
14.....	17 6	27	- 6	6	.....	.....	.....
21.....	18 9	36	-15	12	15	- 3	- 3
28.....	18 0	18	- 3	.....	.....	.....	6
Dec. 5.....	18 6	24	-30	.....	18	-12	.....
12.....	16 0	51	- 6	.....	24	12	.....
19.....	16 0	0	-12	.....	.....	.....	.....
26.....	.....	.....	.....	.....	.....	.....	.....
Jan. 2.....	17 6	42	9	.....	15	6	.....
9.....	17 0	0	21	18	- 6	12	.....
16.....	19 9	18	-33	-21	-24	-21	-33
23.....	18 0	51	-24	0	0	.....	-63
30.....	14 9	105	27	51	.....	27	.....
Feb. 6.....	18 0	24	-27	24	.....	.....	.....

Source: Fruit auction sales catalogues 1937-38.

TABLE 30.—THE FREIGHT RATES ON APPLES COVERING ROAD AND RAIL TRAFFIC IN ENGLAND, MAY, 1939, WERE AS FOLLOWS

Freight Rates—Road		Per Ton
14 Tons—London to Liverpool.. . . .		19/6d Full Load
“ “ Manchester.. . . .		19/-
“ “ Hull.. . . .		25/-
“ “ Bristol.. . . .		15/-
“ “ Newcastle.. . . .		29/-
14 Tons—Liverpool to London.. . . .		22/6d Full Load
“ “ Manchester.. . . .		10/-
“ “ Hull.. . . .		21/-
“ “ Bristol.. . . .		21/-
“ “ Newcastle.. . . .		23/6

There is a very much less volume of traffic between Liverpool and London than between London and Liverpool thus accounting for the difference in the rate one way as compared with the other.

#### Freight Rates—Rail

1 ton —2,240 lbs.  
1 “ —14 barrels  
4.5 tons—1 standard truck (car)

		Per Ton
Liverpool to London 10 tons collected Liverpool delivered London..		23/8d
Less than 10 tons collected Liverpool delivered London.. . .		31/6d
Liverpool to Manchester 2 tons delivered Manchester.. . . .		8/5d
“ “ Newcastle 4 tons delivered Newcastle.. . . .		18/5d
“ “ “ 2 tons delivered Newcastle.. . . .		26/3d
“ “ Cardiff 2 tons delivered Cardiff.. . . .		29/8d
“ “ Hull 10 tons collected Liverpool or delivered Hull.		21/-
“ “ Hull 4 tons collected.. . . .		25/3d

“Delivered” means delivered to consignees’ premises at destination.

NOTE.—There is not a flat rate per car-lot operative to all points from Liverpool; calculations are based on tons, cwt. quarters and pounds.

The following excerpt is taken from a letter from Mr. W. B. Gornall, Canadian Government Fruit Trade Commissioner, London, England under date of April 18, 1939 in reply to an enquiry regarding inter-auction market movements of apples.

It is quite true that the range in value received on any one market is often greater than the difference between the average for each market. This is understandable when the rather wide difference in quality which is often to be found is taken into consideration.

With respect to movement of fruit between one market and another, in order to obtain price advantage, there is very little evidence available to indicate that such movement is of any appreciable proportion. I am personally aware of the particular movement of Nova Scotia apples from Cardiff to London, Liverpool to London and Liverpool to Glasgow, but the occasions are rare and I do not think that it is common practice. There is, however, a movement from the principal ports of import to certain inland markets, and buyers are likely to purchase in London or Liverpool or elsewhere wherever prices are most favourable from the buying point of view.

TABLE 31.—DIFFERENCE IN WEEKLY AVERAGE PRICES BETWEEN LIVERPOOL AND FIVE MARKETS IN THE UNITED KINGDOM FOR THE SAME GRADE AND SIZE OF APPLES IN THE TWO YEARS 1936 AND 1937

Variety	Number of observations all markets	Number of times that difference exceeded range in Liverpool at				
		London	Manchester	Newcastle	Cardiff	Hull
Baldwin (2½" up).....	90	8	5	5	5	2
Gravenstein (2½" up).....	17	1	1	1	0	0
Russet (2½" up).....	85	9	7	4	1	0
Russet (2½-2½").....	92	7	2	5	1	1
Stark (2½" up).....	96	4	4	8	4	2
Total.....	380	29	19	23	11	5

TABLE 32.—TEMPERATURE OF APPLES AT TIME OF LOADING ON STEAMERS FOR EXPORT AT HALIFAX AND PORT WILLIAMS DURING THREE SEASONS 1935-36-37

Period of loading	1935-36		1936-37		1937-38	
	Number of shipments	Average temperature	Number of shipments	Average temperature	Number of shipments	Average temperature
		°F.		°F.		°F.
Aug. 16-31.....					1	65
Sept. 1-15.....	2	63	2	61	10	67
16-30.....	11	59	7	61	8	66
Oct. 1-15.....	13	56	9	55	12	50
16-31.....	11	52	10	53	7	50
Nov. 1-15.....	11	52	9	49	10	47
15-30.....	12	46	6	43	13	44
Dec. 1-15.....	15	39	15	40	11	41
15-31.....	17	37	14	38	16	38
Jan. 1-15.....	13	37	18	40	17	36
15-31.....	13	35	21	38	18	36
Feb. 1-15.....	13	34	16	37	13	36
15-28.....	12	36	17	36	14	34
Mar. 1-15.....	18	38	11	38	14	34
15-31.....	10	44	10	40	7	38
Apr. 1-15.....			4	41	6	38
15-30.....			2	41	1	39

TABLE 33.—AVERAGE FAHRENHEIT TEMPERATURES IN CARGO HOLDS OF NINETY-THREE STEAMERS IN TRANSIT CARRYING APPLES FROM HALIFAX, NOVA SCOTIA TO LIVERPOOL DURING THE SEASONS 1935-36-37

Period of sailing		Average hold temperatures in transit and deviations from average		
		1935-36 average and deviation	1936-37 average and deviation	1937-38 average and deviation
		°F.	°F.	°F.
August	16-31.....			69-5
September	1-15.....	66-2 <sup>1</sup>	59-4	69-5
	16-30.....	58-5	59-6	63-4
October	1-15.....	57-4	58-5	58-6
	16-31.....	52-4	55-5	53-5
November	1-15.....	52-2	51-4	48-3
	16-30.....	49-5	47-7	45-5
December	1-15.....	40-4	43-5	45-5
	16-31.....	39-5	40-7	38-6
January	1-15.....	42-5	39-4	39-5
	16-31.....	38-5	39-5	38-6
February	1-15.....	35-6	38-5	39-6
	16-28.....	32-6	39-5	37-8
March	1-15.....	66-2	37-7	39-8
	16-31.....	39-6		38-9

<sup>1</sup> Interpret as average of 66 degrees with average maximum of 68 degrees and average minimum of 64 degrees.



TABLE 34.—PERCENTAGE OF BARRELS CLASSIFIED AS SLACK ON LIVERPOOL AUCTION IN RELATION TO AVERAGE HOLD TEMPERATURES AT TIME OF LOADING IN NOVA SCOTIA DURING THE SHIPPING SEASONS 1935-36-37

Temperature		Number of steamers		Barrels sold from steamers		
Grouping	Average	Total	Carried barrels classified slack	Total	Slack	Per cent slack
°F.	°F.	No.	No.	No.	No.	p.c.
70 and over.....	74	2	2	5,172	3,432	66
60 to 70.....	63	14	10	26,847	4,141	15
50 to 60.....	53	18	15	43,485	3,652	8
40 to 50.....	44	55	29	83,284	5,030	6
30 to 40.....	35	30	12	48,914	1,468	3
Under 30.....	28	1	1	1,045	683	65
Total.....		120	69	208,747	18,406	9
Unrecorded.....		1	1	2,458	100	4
Refrigeration.....		1	1	4,186	754	18
GRAND TOTAL.....		122	71	215,391	19,260	9

TABLE 35.—PERCENTAGE OF BARRELS CLASSIFIED AS SLACKS IN RELATION TO AVERAGE NUMBER OF DAYS IN TRANSIT FROM HALIFAX TO LIVERPOOL FROM NOVEMBER 1 TO MARCH 1 DURING THE SHIPPING SEASONS 1935-36-37

Days in Transit		Number of steamers	Barrels sold from steamers		
Grouping	Average for group		Total	Classified slack	Per cent slack
days	days	No.	No.	No.	p.c.
12 and over.....	13.1	8	15,536	1,383	9
10 to 12.....	10.5	13	22,602	1,015	5
8 to 10.....	8.7	32	33,746	877	3
Unrecorded.....		26	57,147	5,822	10
All.....		79	129,031	9,097	7

TABLE 36.—ASSOCIATION BETWEEN SLACK BARRELS AND PRICE RETURNS TO 15 COMPANIES

Grouping	Total barrels	Barrels classified slack	Per cent slack	Seven-year average return
Upper third.....	126,345	2,560	2	2.27
Middle third.....	28,348	1,788	6	2.21
Lower third.....	74,040	6,238	8	2.17

TABLE 37.—VARIATIONS IN CHARGES AGAINST A BARREL OF APPLES AMONG MARKETS IN THE UNITED KINGDOM SOLD THROUGH THE SAME BROKERAGE FIRM IN 1937-38. (SELLING PRICE ON EACH MARKET 18s., EXCHANGE AT \$4.857 TO £ STERLING)

—	Liverpool	Man- chester	London	Cardiff	Newcastle	Glasgow
	\$	\$	\$	\$	\$	\$
Ocean freight.....	0.727	0.715	0.736	0.728	0.717	0.728
Handling charges.....	0.364	0.385	0.425	0.382	0.364	0.364
Brokerage.....	0.131	0.131	0.131	0.131	0.131	0.131
Showing samples.....					0.006	0.012
Total.....	1.22	1.23	1.29	1.24	1.22	1.24

TABLE 38.—PRICES, CHARGES AND RETURNS ON A BARREL OF KING APPLES SHIPPED FROM WOLFVILLE, N.S. AND CONSIGNED TO A BROKER IN LIVERPOOL IN THE MONTH OF DECEMBER EACH YEAR FROM 1931 TO 1937

Transactions affecting prices and returns	1931-32	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Primary sale.....	17 0	18 6	12 0	14 6	20 3	17 0	18 0
	\$	\$	\$	\$	\$	\$	\$
Rate of exchange.....	4.250	3.740	5.030	4.850	4.975	4.872	4.950
Gross sales price.....	3.610	3.460	3.020	3.520	5.040	4.140	4.450
Handling charges.....	0.301	0.235	0.356	0.344	0.352	0.335	0.304*
Commission at 3 per cent....	0.108	0.104	0.091	0.106	0.151	0.124	0.131
Charges in United Kingdom..	0.409	0.339	0.447	0.450	0.503	0.469	0.495
Advertising.....	0.005	0.004	0.005				
Ocean freight.....	0.700	0.550	0.600	0.540	0.540	0.585	0.750
Rail to Halifax.....	0.180	0.130	0.160	0.135	0.135	0.150	0.175
Insurance.....	0.010	0.010	0.010	0.010	0.010	0.008	0.010
Inspection.....	0.015	0.015	0.015	0.010	0.010	0.014	0.014
Marketing Board.....				0.010	0.010		
Selling Agency.....	0.070	0.060	0.060	0.060	0.060	0.060	0.060
Charges in Nova Scotia.....	0.275	0.215	0.245	0.225	0.225	0.232	0.259
Total charges.....	1.389	1.138	1.297	1.215	1.268	1.286	1.504
Return to company.....	2.221	2.322	1.723	2.305	3.772	2.854	2.946

\* Handling charge at 1s. 6d. per barrel.

TABLE 39.—CHARGES AND RETURNS ON A BARREL OF KING APPLES CONSIGNED TO LIVERPOOL  
EXPRESSED AS PERCENTAGES OF THE SALES PRICE

Transactions affecting prices and returns	1931-32	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Primary sale.....	17 0	18 6	12 0	14 6	20 3	17 0	18 0
	\$	\$	\$	\$	\$	\$	\$
Rate of exchange.....	4.250	4.740	5.030	4.850	4.975	4.872	4.950
Gross sales price per cent.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Handling.....	8.3	7.6	11.8	9.8	7.0	8.3	8.2*
Commission ..	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Charges in United Kingdom.	11.3	10.6	14.8	12.8	10.0	11.3	11.2
Advertising.....	0.1	0.1	0.2				
Ocean freight.....	19.4	15.9	19.9	15.3	10.7	14.1	16.8
Rail to Halifax	5.0	3.8	5.3	3.8	2.7	3.6	3.9
Insurance.....	0.3	0.3	0.3	0.3	0.2	0.2	0.2
Inspection.....	0.4	0.4	0.4	0.3	0.2	0.3	0.3
Marketing Board				0.3	0.2		
Selling Agency.....	1.9	1.7	2.0	1.7	1.2	1.4	1.3
Charges in Nova Scotia.....	7.6	5.2	8.0	6.4	4.5	5.5	5.7
Total charges.....	38.4	32.8	42.9	34.5	25.2	30.9	33.7
Return to company.....	61.6	67.2	57.1	65.5	74.8	69.1	66.3

\* Handling charges at 1s. 6d. per barrel.

TABLE 40.—PRICES, OCEAN AND RAIL FREIGHT RATES FROM 1931 TO 1937 EXPRESSED IN PER CENT  
OF THE SEVEN-YEAR AVERAGE

Year	Liverpool December price	Ocean freight rate	Rail freight rate	Per cent of average		
				Liverpool price	Ocean rate	Rail rate
	s. d.	cts.	cts.			
1931-32.....	17 0	70	18	101	115	118
1932-33.....	18 6	55	13	110	90	86
1933-34.....	12 0	60	16	72	98	105
1934-35.....	14 6	54	13½	87	89	89
1935-36.....	20 3	54	13½	121	89	89
1936-37.....	17 0	58½	15	101	96	99
1937-38.....	18 0	75	17½	107	123	115
Average.....	16 9	61	15			

Source: Price for King apples from account sales. Rail and ocean rates from Dominion Atlantic Railway Company, Kentville, Nova Scotia.



TABLE 41.—STATEMENT OF AVERAGE OPERATIONS OF 15 FRUIT PACKING COMPANIES IN NOVA SCOTIA FOR THE YEAR ENDED MAY 31, 1938

Revenue and expenses	Average for all companies	Itemized as per cent of total business		
		Average	High	Low
	\$	p.c.	p.c.	p.c.
Total business.....	87,509	100.00	100.00	100.00
Returns from sale of apples.....	47,191	53.93	76.72	18.14
Returned to producers.....	40,254	46.00	65.54	15.85
Gross margin on apples.....	6,937	7.93	11.87	2.29
Sale of supplies.....	38,929	44.49	75.99	19.32
Cost of supplies.....	35,574	40.65	71.48	18.50
Gross margin on supplies.....	3,355	3.84	5.84	0.82
Other income.....	1,389	1.58	5.87	0.57
Total gross margin.....	11,681	13.35	17.22	10.32
Expenses—				
Wages and salaries.....	5,636	6.44	10.33	4.53
Packing room supplies.....	781	0.89	1.78	0.27
Depreciation.....	1,249	1.43	3.12	0.72
Taxes.....	215	0.25	0.66	0.09
Insurance.....	396	0.45	0.99	0.22
Repairs and maintenance.....	228	0.26	0.60	0.00
Light, power, fuel and water.....	335	0.38	0.65	0.00
Site rental.....	21	0.02	0.24	0.00
Storage hired.....	71	0.08	0.45	0.00
Office expense.....	247	0.28	0.68	0.10
General expense.....	343	0.39	0.98	0.05
Interest.....	1,018	1.16	5.28	0.42
Provision for bad debts.....	380	0.43	1.52	0.00
Cold storage supplies.....	22	0.03	0.10	0.00
Total expenses.....	10,942	12.49	20.86	9.20
Net profit for the year.....	739	0.84	2.99	—3.64

TABLE 42.—AVERAGE BALANCE SHEET FOR 15 FRUIT PACKING COMPANIES IN NOVA SCOTIA AS AT MAY 31, 1938

	Average for all companies	Itemized as per cent of total		
		Average	High	Low
ASSETS	\$	p.c.	p.c.	p.c.
Cash on hand and in bank.....	2,094	5.11	14.31	0.03
Accounts receivable.....	13,539	33.03	58.38	1.96
Merchandise inventory.....	3,983	9.72	16.24	0.00
Other.....	514	1.25	3.68	0.00
Total current assets.....	20,130	49.11	74.96	9.22
Plant.....	19,070	46.52	90.78	21.72
Investments.....	1,775	4.33	14.90	0.00
Other.....	16	0.04	0.74	0.00
Total assets.....	40,991	100.00	100.00	100.00
LIABILITIES				
Accounts payable and accrued.....	10,146	24.75	42.86	3.94
Bank loans.....	1,667	4.07	42.45	0.00
Other.....	12	0.03	0.46	0.00
Total current liabilities.....	11,825	28.85	54.86	12.20
Mortgage payable.....	7,526	18.36	39.13	0.00
Loans payable.....	3,752	9.15	71.34	0.00
Total liabilities.....	23,103	56.36	108.89	44.77
NET WORTH				
Capital stock.....	10,304	25.14	57.39	7.93
Cold storage subsidy.....	2,672	6.52	20.35	0.00
Reserves.....	2,818	6.87	44.36	0.00
Surplus.....	2,094	5.11	30.41	-39.89
Total net worth.....	17,888	43.64	87.80	-8.89
Total liabilities and net worth.....	40,991	100.00	100.00	100.00

TABLE 43.—STATEMENT OF SURPLUS FOR 15 FRUIT PACKING COMPANIES IN NOVA SCOTIA  
AS AT MAY 31, 1933

	Average for all companies	High	Low
	\$	\$	\$
Surplus at May 31, 1937.....	2,653	18,668	-8,497
Net profit for the year.....	739	4,903	-2,412
Surplus available for dividends.....	3,392	22,773	-9,393
<i>Less:</i> Dividends on capital.....	210	1,294	0
Patronage dividends.....	826	5,161	0
Carried to reserves.....	262	3,900	-1,362
Undivided surplus.....	2,094	18,668	-9,393

TABLE 44.—AVERAGE COST OF PACKING 100 BARRELS OF APPLES ON A PACKED-OUT BASIS FOR 15 FRUIT PACKING COMPANIES IN NOVA SCOTIA FOR THE SEASON 1937-38

	Average for all companies	Cost per 100 barrels		
		Average	High	Low
	\$	\$	\$	\$
Packing room wages.....	3,374	16.35	24.83	12.64
Packing room supplies.....	781	3.78	5.89	1.93
Management and office salaries.....	1,353	6.56	17.15	2.12
Taxes, site rental and storage hired.....	299	1.45	3.00	0.33
Insurance.....	306	1.48	3.76	0.54
Repairs and maintenance.....	186	0.91	2.49	0.00
Light, power, fuel and water.....	202	0.98	1.96	0.00
Office expense.....	205	0.99	6.26	0.00
General expense.....	355	1.72	6.87	0.26
Depreciation.....	795	3.85	9.27	2.19
Interest.....	760	3.68	11.63	1.57
Total cost (without deductions).....	8,616	41.75	64.17	32.64
Miscellaneous income.....	944	4.58	13.62	0.00
Cost less miscellaneous income.....	7,672	37.17	56.05	30.50
Profit on trading.....	1,002	4.86	12.37	-4.63
Net cost of packing apples.....	6,670	32.31	55.03	22.20



TABLE 45.—COSTS OF COLD STORAGE WHEN COSTS ARE DISTRIBUTED OVER ALL VARIETIES HANDLED AND VARIETIES RECOMMENDED FOR COLD STORAGE ON A TREE-RUN BASIS DURING THE SEASON 1937-38

	Average for cold storage companies	Average cost per 100 barrels	
		All varieties	Varieties named <sup>1</sup>
	\$	\$	\$
Total cost of operation:			
Wages.....	382	0.93	2.25
Supplies.....	107	0.26	0.63
Insurance.....	115	0.28	0.68
Power.....	486	1.18	2.87
Depreciation.....	1,704	4.14	10.05
Interest.....	852	2.07	5.02
Totals.....	3,646	8.86	21.50
Cost exclusive of subsidy:			
Wages.....	382	0.93	2.25
Supplies.....	107	0.26	0.63
Insurance.....	115	0.28	0.68
Power.....	486	1.18	2.87
Depreciation.....	368	0.89	2.17
Interest.....	184	0.45	1.09
Totals.....	1,642	3.99	9.69

<sup>1</sup> Gravenstein, Red Gravenstein, Cox Orange, Ribston, King, McIntosh Red, Golden Russet, Northern Spy.

TABLE 46.—COMPARATIVE COSTS OF PACKING FOR COMPANIES EQUIPPED WITH COLD STORAGE AND COMPANIES WITH COMMON STORAGE IN 1937-38 WITH COSTS DISTRIBUTED OVER ALL BARRELS HANDLED

Type of storage	Cost basis	Packing basis	Total barrels	Cost per hundred barrels		
				With-out deductions	Less miscellaneous income	Less income and trading profit
				\$	\$	\$
Cold.....	Total operation.....	tree-run	123,587	45.76	41.65	36.12
	Total operation, less subsidy....	tree-run	123,587	40.89	36.78	31.25
Common.....	.....	tree-run	124,652	35.56	31.38	25.96
Cold.....	Total operation.....	packed-out	108,109	52.54	47.80	41.48
	Total operation, less subsidy....	packed-out	108,109	46.98	42.24	35.92
Common.....	.....	packed-out	106,769	41.57	36.69	30.34

TABLE 47.—NET RETURN FOR GROWER FROM COMPANIES EQUIPPED WITH COLD STORAGE AND COMMON STORAGE WITH COSTS DISTRIBUTED OVER ALL APPLES HANDLED, 1937-38

Type of Storage	Cost basis	Gross return per barrel tree-run	Cost per barrel tree-run	Net return for grower
		\$	cts.	\$
Cold.....	Total operation.....	2.10	36.12	1.74
	Total operation, less subsidy.....	2.10	31.25	1.79
Common.....		2.22	25.96	1.96

TABLE 48.—RANKING OF COMPANIES ON SEVEN-YEAR AND SEASONAL AVERAGE PRICE RETURNS FOR MAIN VARIETIES 1931 TO 1938<sup>1</sup>

Company	Seven-year average return	1931-32 return	1932-33 return	1933-34 return	1934-35 return	1935-36 return	1936-37 return	1937-38 return
	\$	\$	\$	\$	\$	\$	\$	\$
<i>Upper third.....</i>	2.39							
16.....	2.51	2.36	2.27	2.19	2.40	3.48	2.36	2.54
7.....	2.41	2.27	2.12	1.90	2.08	3.61	2.26	2.60
15.....	2.41	2.47	2.20	1.95	1.99	3.55	2.29	2.42
2.....	2.39	2.34	2.13	2.08	2.24	3.46	2.18	2.31
6.....	2.33	2.38	2.07	1.94	2.05	3.38	2.07	2.45
17.....	2.30	2.17	1.82	1.94	2.09	3.39	2.17	2.51
<i>Middle third.....</i>	2.20							
9.....	2.26	2.18	2.16	1.74	1.98	3.30	1.97	2.47
4.....	2.25	2.20	2.13	1.79	1.89	3.24	2.12	2.39
12.....	2.24	2.16	2.16	1.84	2.01	3.25	1.90	2.35
13.....	2.21	2.16	2.03	1.75	1.88	3.30	2.07	2.30
18.....	2.14	2.02	2.05	1.93	1.86	3.13	1.52	2.45
11.....	2.12	2.26	1.88	1.82	1.81	3.15	1.73	2.19
<i>Lower third.....</i>	2.04							
5.....	2.11	2.16	2.03	1.68	1.76	3.22	1.78	2.17
14.....	2.10	2.29	2.11	1.93	2.02	2.29	1.93	2.14
10.....	2.10	2.06	2.01	1.66	1.81	3.02	1.90	2.25
8.....	2.06	2.01	1.79	1.83	1.66	3.25	1.85	2.01
1.....	1.97	1.65	1.89	1.40	2.07	2.93	1.89	
3.....	1.92	1.91	1.84	1.44	1.58	3.03	1.59	2.02

<sup>1</sup> Baldwin, Ben Davis, Gravenstein, Golden Russet, King, Ribston, Stark.









